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FRAGMENT HAZARDS FROM MUNITIONS IN CONTAINERS

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U.S. ARMY LABORATORY COMMAND

BALLISTIC RESEARCH LABORATORY
ABERDEEN PROVING GROUND, MARYLAND

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13. ABSTRACT *(Maximum 200 words)*

A series of eleven tests were conducted to identify debris, fragments, and airblast hazards associated with the detonation of the explosives in Conex containers. Many fragments were found beyond 300 ft in Test Nos. 1, 2, 3, 6, 9, 10 and 11. Only a few fragments were found beyond 300 ft in Test Nos. 4, 5, 7, and 8. Some fragments were found beyond 600 ft in Test Nos. 6, 9, 10, and 11. A few metal fragments of Conex container were also found between 900 and 1,155 ft in Test Nos. 9, 10 and 11. The fragment density at different locations is calculated by using 30° sectors. For 500 lb of explosive, the fragment density of less than 1 fragment per 600 ft^2 is at about 800 ft. For 160 lb of explosive (sandbagged test), the fragment density of less than 1 fragment per 600 ft^2 is at about 600 ft. On the other hand, the fragment density of less than 1 fragment per 600 ft for 75 lb of explosive is in between 700 to 800 ft. Comparison of sandbagged and unsandbagged test data clearly shows that sandbagging the containers does decrease the fragment density at larger distance. It also suggests that more tests may be needed for explosive weights between 75 and 500 lb and for explosive weights more than 500 lb. The test data approximately supports the existing explosive weight and distance curve.

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1. INTRODUCTION

This study had three objectives. The first objective was to determine the type of debris and fragment hazard distance from the point of reaction when the munitions in a single Conex container are detonated. The second objective was to prevent propagation of reaction from one container to an adjacent container, and the third objective was to minimize the physical damage to the adjacent Conex by the addition of sandbag walls along the three sides of containers. A large quantity of different types of munitions are stored in a conex container including small caliber ammunition, fragmentation grenades, smoke grenades, signal flares, M42 submunitions, mines, file destroyer, and rockets. Table 1 shows a typical basic load of ammunition stored in a container.

The project was funded and supported by the Department of Defense Explosive Safety Board and the Project Manager for Ammunition Logistics. The task of designing and conducting the tests and providing the technical data package was undertaken by the Ballistic Research Laboratory (BRL), Aberdeen Proving Ground, MD.

2. BACKGROUND

Limited availability of land area for munitions storage at overseas bases, coupled with civilian encroachment, and the need to build additional facilities on available land has placed constraints on munitions storage capabilities. If a fire or explosion should occur, whether it results from accident, enemy attack or sabotage, then the adjacent explosive container and facilities including personnel in the vicinity of the explosion site must be protected to a predetermined, practical standard. The explosion must not propagate from one container to other. Generally, when ignited, explosives burn and explode, producing fast fragments from metal touching or near the explosive, airblast, cratering, ground shock, flame and radiant heat, and debris and explosive items.

3. TEST APPROACH AND RESULTS

A series of 11 tests were performed to identify debris, fragments, and airblast hazards associated with the detonation of the explosives (inside a container) and to determine whether

the mass detonation of explosives in one Conex container would propagate to the adjacent container. A Conex container is made of 1/8-in-thick corrugated steel. The inside dimensions of the Conex container are: 92-in-long, 72-in-wide, and 70-in-high.

Fuzed 66-mm M72A2 rockets and 40-mm M433 cartridge were considered safety hazards (fuzed rockets might go off during the fragment recovery process and M433 contains phosphorous which might cause bodily harm); therefore, in the tests, M433 cartridges were replaced with M42 grenades and unfuzed rockets replaced fuzed rockets.

The center of explosion for each test was established and a search pattern grid was laid. Each area (sector) was marked off with white tape/paint. Fragments were collected in 12 thirty degree wide collection zones 360 degrees around the container to a distance of 600 ft.

3.1 Tests Conducted At Socorro, New Mexico.

3.1.1 Test 1. The goal of this test was to identify external debris and fragments and to determine the quantity-distance arcs when the explosive (in the Conex container) was detonated. Three wooden racks were built and placed inside the container. The grenades, rockets, fragmentation and smoke grenades, a file destroyer, and small caliber munitions were placed on the racks in the container. Table 2 lists the ammunition placed inside the container and Figure 1 shows the layout configuration of the munitions placed inside the container. Twelve M18A1 mines were placed in the middle of the container floor. Each mine contained about 1.5 lb of explosive. No sandbags were used to confine the container.

These mines were remotely detonated. The container and many of the ammunition boxes were broken up into many fragments. Most of the fragments and other debris were located within 100 ft from the point of detonation, but some of the fragments were found beyond 350 ft from the test location. Three metal fragments from the Conex were located between 320 ft and 375 ft from the point of reaction. Five fragmentation grenades were located at 375 ft. It was estimated that a total of 25 to 35 lb of explosive (including the explosive in the mines) was consumed or detonated.

3.1.2 Test 2. The goal of this test was to assess the damage to the acceptor container and its contents when the explosive in the donor Conex is detonated. The acceptor container was placed at an arbitrarily chosen distance of 15 ft from the donor container. The same amount and type of munitions were placed in the donor container as was in Test 1. The mines were not available at the time of this test, so a 20-lb C-4 bare charge was placed in the donor container. This increased the net explosive weight from 160 lb to 162 lb. Wooden boxes filled with sand (instead of munitions) were placed on the wooden racks inside the acceptor Conex.

It was also decided to make pressure measurements. The pressure transducers were placed in front of the donor container at 30 ft, 60 ft, and 90 ft from the container. The locations for the pressure transducers were arbitrarily selected. No sandbags were used to confine the containers. Figure 2 shows the set-up configuration of the acceptor and the donor containers.

The C-4 charge was detonated. The wooden ammunition boxes and other debris burned near the acceptor container for more than one hour. The acceptor container was turned over and sustained some physical damage. The sand filled boxes were broken. The donor container was broken up into many fragments. Many of these fragments were thrown to a distance greater than 300 ft. Some fragments and other rounds were found beyond 375 ft from the test location, but most of the fragments were located within a radius of 100 ft.

Peak pressures of 6.7 psi at 30 ft and 3.40 psi at 60 ft locations were registered by the transducers. No signal was obtained at 90 ft.

It was estimated from the recovered munitions that about 25 lb to 35 lb of explosive was consumed in this test.

3.1.3. Test 3. The goal of this test was to assess the damage to the live munitions inside the acceptor Conex by decreasing the separation distance (distance between the containers) from 15 ft to 8 ft. The same amount and type of munitions were placed in the donor container

as was in Test 1. Live ammunition (rockets, grenades, mines, and M42 grenades) and sand filled boxes were placed in the acceptor Conex.

No pressure signal was recorded by the pressure transducer at the 90 ft location in Test 2, so the location of this transducer was changed from 90 ft to 75 ft. The locations of the other two transducers remained the same (30 and 60 ft). No sandbags were used to confine the containers. Figure 3 shows the set-up configuration.

Twelve mines (18 lb of explosive), placed in the middle of the donor container, were detonated. Wooden boxes and other fragments burned in the space between the two containers for one to two hours. Some of the signal flares and grenades were cooked-off because of the fire.

The acceptor container was flipped over and caved in. The live munitions inside the acceptor Conex did not detonate. Some of the munition boxes were broken, but no damage was done to the munitions inside the acceptor container.

The fragments and other debris were thrown out to a distance greater than 300 ft from the point of reaction. Ten metal fragments were found between 300 ft and 335 ft from the test location. Thirty-five M42 grenades, two smoke grenades, and one fragmentation grenade were found between 300 ft and 350 ft.

The pressures registered by the transducers were not as high as the pressures obtained in Test 2. Peak pressures of 3.33 psi at 30 ft, 2.4 psi at 60 ft, and 0.3 psi at 75 ft were recorded by the transducers in this test.

It was estimated that about 25 to 35 lb of explosive (including the explosive in the mines) were consumed during the detonation process.

3.1.4 Test 4. The aim of this test was to investigate whether some kind of sandbag wall/shield will prevent the acceptor container from overturning and sustaining physical damage. The same amount and type of munition was placed in the donor container as was in Test 1. The acceptor Conex was partially filled with the same munitions as in the donor

container. The sandbag walls, about 1 ft taller than the height of the container, were built long three sides of the containers. No sandbag walls were built on the front sides of the containers. The pressure transducers were placed at the same locations as were in Test 3. Figure 4 shows the set-up configuration.

Again, 12 mines (18 lb of explosive) inside the donor Conex were detonated. The wooden boxes and other debris burned for more than two hours. Some munitions (grenades, flares, etc.) were cooked-off. The middle sandbag wall was partially collapsed. The acceptor Conex did not move or flip over and no damage was done to the munitions inside the acceptor Conex. Much of the blast was absorbed by the sandbag wall, thus preventing the acceptor Conex from sustaining much damage.

The donor container and other munition boxes were broken into many fragments. Two fragments (3 x 6 ft) from the door of the Conex container were located at 369 ft and 561 ft from the test location. One fragment from the Conex was found at 450 ft and a 66-mm rocket (warhead) was found at 305 ft.

The pressures recorded by the transducers were higher than the pressures obtained in Test 3. Peak pressures of 6 psi at 30 ft, 4 psi at 60 ft, and 3 psi at 75 ft were registered by the transducers.

A total of 25 to 35 lb of explosive was assumed to be consumed or detonated during the detonation or burning process.

3.1.5 Test 5. The purpose of this test was to learn about the extent of the fragment/debris hazards by detonating the same amount of explosives in the donor Conex when sandbags were placed on top of the donor container. The same type of sandbag walls were built along three sides of the containers as in Test 4. The same type and amount of munitions were placed in the containers as was in Test 4. The set-up is shown in Figure 5.

Twelve mines (1.5 lb of explosive in each mine) were detonated inside the donor container. It was not a big explosion as compared to the explosions in the last four tests.

The door of the donor Conex was found between 50 and 60 ft from the container. The roof of the donor container flew up but fell right back in the container.

The debris and fragments did not travel very far from the point of detonation. A few parts of the signal flares were located beyond 300 ft from the test location. Most of the munitions and other fragments burned inside the donor container and continued burning for more than three hours. It was very difficult to estimate the amount of explosives burned during the detonation and/or burning process.

The sandbag wall between the acceptor and the donor containers was partially collapsed. The walls of the acceptor container suffered some damage, but the container itself remained intact. The acceptor container did not flip or turnover.

3.1.6 Test 6. The Department of Defense Explosive Safety Board requested that we should conduct a test by detonating 160 lb (100-lb bare charge and 60 lb explosive in other munitions) of explosives inside the donor container. The sandbag walls built along three sides of the acceptor and the donor containers in Test 4 and 5 were very massive and time consuming, so it was decided to modify the sandbag wall configuration.

Double sandbag walls along the three sides of the containers were built for this test. Munition placement inside the donor Conex was changed without changing the total amount of explosive. This time, 60 lb of explosive (rockets, M42 grenades, and fragmentation grenades) were placed close to a 100-lb C-4 bare charge. The 160 lb of explosive was placed against the inside wall of the donor Conex (the wall closest to the acceptor Conex) and on the lower shelf of the wooden rack. Figure 6 shows the actual configuration of the ammunition placement in the donor and acceptor containers.

When the 100 lb of explosive was detonated, a large fire ball was seen and a tremendous explosion was heard. A few flares and grenades burned for a few minutes. No other fire was observed in this test. No explosives (rockets, mines, etc.) were recovered. This indicates that all 160 lb of explosive was consumed during the explosion process. The detonation did not propagate to the live munitions inside the acceptor Conex.

One side (side towards the donor Conex) of the acceptor Conex was caved in but it did not flip over. The donor container and some of the munition boxes were broken into many fragments. These fragments were found at different locations. Twenty-six metal fragments (8-in to 5-ft-long) were found at a distance between 440 ft and 673 ft from ground zero.

3.1.7 Test 7. No sandbag wall was built in front of the Conex in any of the six previously conducted tests. In this test, a 12-ft-long and 7-ft-high sandbag wall was built at a distance of 15 ft from the front wall of the Conex container. The sandbag walls were also built around three sides of the container. Two layers of sandbags were also placed on top of the container.

The same type and amount of munitions were placed in the donor container as in Test 2. Three pressure transducers were placed at a distance of 30 ft, 60 ft, and 75 ft from the front door of the container. Twelve mines were placed at the center of the container. The stacking details of the munitions inside the container are shown in Figure 7.

The mines (18 lb of explosive) were remotely detonated. About 70% of the fragments were located within a 60 ft radius. A few fragments were also found 300 ft beyond the container. A few grenades and flares cooked-off and the wooden boxes and other debris burned for many hours. The pressures of 3.8 psi at 30 ft, 2.2 psi at 60 ft, and 1.0 psi at 75 ft were registered by the pressure transducers.

It was estimated that about 25 to 35 lb of explosive was consumed during the detonation and burning process.

3.1.8 Test 8. We wanted to check whether increasing the length of the front sandbag wall would have any effect in reducing the number of fragments. So a 20-ft-long and 7-ft-high wall was constructed in front of the Conex container at a distance of 15 ft. Three sides of the Conex container were also confined by the sandbag walls and two layers of sandbags were placed on the top of the container as in Test 7. The sandbag wall configuration is shown in Figure 8.

The same type and amount of the munitions was placed in the container as in Test 7. Three pressure transducers were placed at the same location as in Test 7. Twelve mines (18 lb of explosive) were placed at the center of the container.

The mines were detonated. Few fragments were found beyond 300 ft from the container. Many grenades, flares, and other small arms cooked-off. It was estimated that about 90-95% of the fragments were in a 60 ft radius. Several fragments burned for many hours. The pressures of 2.2 psi at 30 ft, 2.5 psi at 60 ft, and 0.9 psi at 75 ft were registered by the transducers.

A total of 25 to 35 lb of explosives was estimated to be consumed or detonated during the detonation and burning process.

3.2 Tests Conducted At China Lake, California. The Department of Defense Explosive Safety Board requested that we should conduct a few tests with a large bare charge (75 lb and more inside the Conex) and without any kind of sandbag confinement around the Conex container. These tests could not be conducted at Socorro, NM, because of safety and nonavailability of a large enough flat area for the collection of debris/fragments after the test. So an alternate test site was selected to conduct these tests. No sandbags were used to confine the containers in the next three tests (Test Nos. 9, 10, and 11).

A site in excess of 2,500 ft by 2,500 ft was de-bushed on a generally flat lakebed surface at Cactus Flats, China Lake, CA. The radial lines and circular arcs were staked and marked on the ground with chalk. Radial lines were marked every 30 degrees. Circular arcs were chalked at a distance of 60 ft, 30 ft intervals from 60 to 300 ft and 600 ft. Distances from ground zero were marked at 100 ft intervals along each of the radial lines from 600 to 1,200 ft.

3.2.1 Test 9. The same amount of munitions as used in the tests conducted at Socorro, NM were placed in the container. A 75-lb bare charge (70 lb Comp B and 5 lb C-4) was placed at the center of the container. The remainder of the munitions were placed in the container the same way as in the previous tests. A packing arrangement of the munition in the container is shown in Figure 9. Three Bikini blast pressure gages were placed outside of the door of the container at 30, 60, and 90 ft from ground zero. These are portable, stand-alone gages that permit measurement of blast overpressure ranges for explosive

detonation. A description of the Bikini gage and gage calibration chart is given in Halsey 1989.

The charge was initiated using an explosive bridge wire detonator. The Conex container was broken into many fragments. Some of the fragments were thrown long distances. One fragment was found at a distance of 906 ft and the second fragment was located at a distance of 824 ft from ground zero. The majority of the munitions and other debris or fragments were found within the 60-ft radius. Many smoke grenades were initiated by the detonation of the bare charge. The M72A2 rockets were broken apart by the detonation but did not appear to have functioned. The mines were expelled and survived with minimal damage. The wooden shelves and other wooden ammunition storage boxes were set afire by the detonation but the fire lasted for less than one hour. Some of the ammunition cooked-off.

3.2.2 Test 10. Two Conex containers (acceptor and donor) were employed in this test. The same amount of munitions as used in Test 9 were placed in the donor container. The acceptor container was placed at a distance of 8 ft from the donor container. A few grenades, rockets, mines, and other ammunitions were placed in the acceptor container. Again, three Bikini blast pressure gages were placed at 30, 60, and 90 ft from ground zero. A 500-lb bare charge (495 lb of Comp B and 5 lb of C-4) was placed at the center of the acceptor container. Ammunition placement in the containers is shown in Figure 10.

Again, an explosive wire detonator was used to initiate the 500-lb charge. Both containers were destroyed. A shallow crater was formed under the donor container but no crater was formed under the acceptor container. Fragments of the Conex containers were found at the greatest distances from ground zero. One 6-in by 14-in fragment of container was found at 1,156 ft from ground zero. A 1-in by 3-ft-long rod from the door latch mechanism of the container was found at 1,138 ft. Some of the file destroyer material burned by the fire, but no ammunition inside the acceptor container detonated.

Ammunition boxes were scattered within the area. Most of the boxes were damaged and broken open and some of the ammunition was cooked-off. Four linked 0.50 caliber rounds were located at a distance of 689 ft. One box of 7.62-mm ammunition was found at 1,100 ft. The rockets were broken apart but did not seem to function. The inert mines were expelled

and survived with minimum damage. The signal flares and smoke grenades were scattered in different sectors. The majority of the debris and other fragments were found within 90 ft of ground zero.

3.2.3 Test 11. It was suggested that we should conduct a test by detonating about 160-lb charge inside a Conex container and without any kind of sandbag barrier along three sides of the container.

Three Bikini blast pressure gages were placed outside of the door of the Conex container at 30, 60, and 90 ft from ground zero.

Approximately the same amount of ammunition was placed in the container as was in Test 9. Munitions were placed in the container as shown in Figure 12. The donor charge consisted of a 100 lb Composition B plus 66 lb of Composition B in three MK-15 mines. This charge was placed close to the inside wall of the container. The charge was initiated using a 5-lb C-4 booster charge and an explosive bridge wire detonator.

The container was completely destroyed. Numerous smoke grenades were initiated by the detonation of the charge. The wooden boxes and shelving units were set afire by the heat generated by the detonation process. Some other small ammunitions were cooked-off by the heat and flames generated by the burning of the wood and other debris.

Most of the munitions and other materials were found within 300 ft from ground zero. Most of the ammunition boxes were damaged but the contents did not detonate. The rockets were broken apart and some were totally destroyed. None of the rockets appeared to have detonated. Parts of the rockets were found between 300 and 1,000 ft from ground zero. Only three of the 12 inert mines were expelled and survived with minimal damage. Some grenades were found between 800 and 900 ft. One fragment of chain link fencing was found between 900 and 1,000 ft and another fragment was found between 1,100 and 1,200 ft from ground zero.

A small, shallow crater measuring 16 ft across and 2.5 ft deep was formed underneath the container by the detonation of about 160 to 170 lb of explosive. The measured pressure ranged between 11.4 to 14.0 psi at 30 ft, and 5.06 to 6.2 psi at 60 and 90 ft.

4. OVERALL RESULTS

The locations where the debris/fragments were found varied from test to test. In some tests, the debris/fragments did not go beyond 300 ft from the point of detonation, but, in other tests, some debris/fragments were found beyond 600 ft. The kick-out data from these tests are given in Tables 3-11. The photographs of the recovered munitions/fragments and other debris are given in the Appendix.

The fragment density at any distance was computed on the basis of a worse case assumption. It was assumed that any fragment found in a sector at a distance greater than x ft from the origin could hit a standing person in that sector. The fragment density was computed as the number of fragments divided by the vertical area and multiplied by 600. That gave the fragment density per 600 ft^2. The fragment density for different explosive weights are given in Tables 12-17.

The fragment density at different locations is calculated by using 30 degree sectors. When the mean density was computed, the sectors in which no fragments were found were excluded. The fragment density and distance were plotted for 25, 75, 160, and 500 lb of explosive. These plots are shown in Figures 13 and 14. A major purpose of these tests was to determine the distance at which the fragment density falls below one fragment per 600 ft^2. Without sandbags, this distance was 800 ft when 500 lb of explosive were detonated. When 75 lb of explosive was detonated, this distance was between 700 and 800 ft (only sightly less than the figure for 500 lb). With sandbags, and when 160 lb of explosive were detonated, this distance was 600 ft. Thus, the sandbags appear to reduce the hazardous fragment distance.

In some tests, the fire started a few minutes after the detonation and lasted for a few minutes, but, in other tests, the fire started and lasted for some time, then restarted and kept on burning for many hours. In Tests 2 and 3, the fragments and/or debris in the space between the containers burned for one to two hours. In Test 4, the fire lasted for more than two hours. In Tests 5, 7, and 8, the fragments and other munitions burned many hours. No appreciable fire was observed in Test 6. In Tests 9, 10 and 11, the fire lasted for less than one hour.

Several rounds (7.62-mm, 5.56-mm, 50 cal, flares, grenades, etc.) were cooked-off as a result of fire or heat. Some of the live munitions were recovered in each test. From the recovered munitions, it was estimated that in each of the first four tests about 25 to 35 lb of explosive was consumed during the detonation process. It is estimated that all 160 lb of the explosive was expended in Test 6, because no explosive was recovered in this test.

In Tests 2 and 3, the acceptor Conex was turned/flipped over and caved in, thus sustaining some physical damage. No appreciable damage was done to the contents of the acceptor container. The acceptor Conex did not move or flip over in Tests 4, 5, and 6. Much of the blast was absorbed by the sandbag wall between the containers, thus, preventing the acceptor container from sustaining much damage. The blast inside the donor Conex was so high that it created a 2- to 3-ft-deep crater underneath the donor Conex.

5. SUMMARY AND CONCLUSIONS

A series of tests were conducted to determine the fragment hazard distance when the explosive inside the donor Conex is deliberately or accidently detonated. First, three tests were conducted to determine the external debris and hazard distance, and to check whether the detonation of explosives in one container would detonate the explosives in the adjacent container. The next three tests were conducted with the containers sandbagged on three sides. The next two tests were conducted with the containers sandbagged on three sides and sandbag walls at the front, 15 ft from the containers. Lastly, three tests were conducted by detonating 75, 160, and 500 lb of bare charge in donor containers without sandbags.

Many fragments and debris were found beyond 300 ft in Tests 1, 2, 3, 6, 9, 10 and 11. Fewer fragments and other debris were found beyond 300 ft in Tests 4, 5, 7, and 8. Some fragments were found beyond 600 ft in Tests 6, 9, 10 and 11. A few metal fragments were also found between 900 and 1,155 ft in Tests 9, 10, and 11.

Detonation did not propagate to the adjacent container in any test even when the distance between the containers was decreased to 8 ft. The separation distance of 8 ft was selected because, at overseas bases, the containers were separated by a distance of greater than 6 ft.

Ammunition cook-off occured in all the tests. Sandbagging the containers decreased the fragment density at larger distances but it increased the cook-off and burning rate of the munitions and other debris near the location of the test. So, the probability of cook-off or burning of the munitions and other fragments/debris is greater when the containers are sandbagged.

The following conclusions can be derived from this study:

Detonation of explosives in one container did not propagate to the explosives in an adjacent container when the separation distance was 8 ft (no test was conducted with smaller distance).

Sandbagging the acceptor and the donor containers prevented the adjacent container and its contents from extensive physical or mechanical damage when the explosive in the donor Conex was accidently or deliberately detonated.

Sandbagging the containers decreased the fragment density at large distances but increased the cook-off and burning rate of the munitions and other debris (close to the ground zero). The test data approximately support the existing explosive weight and distance curve.

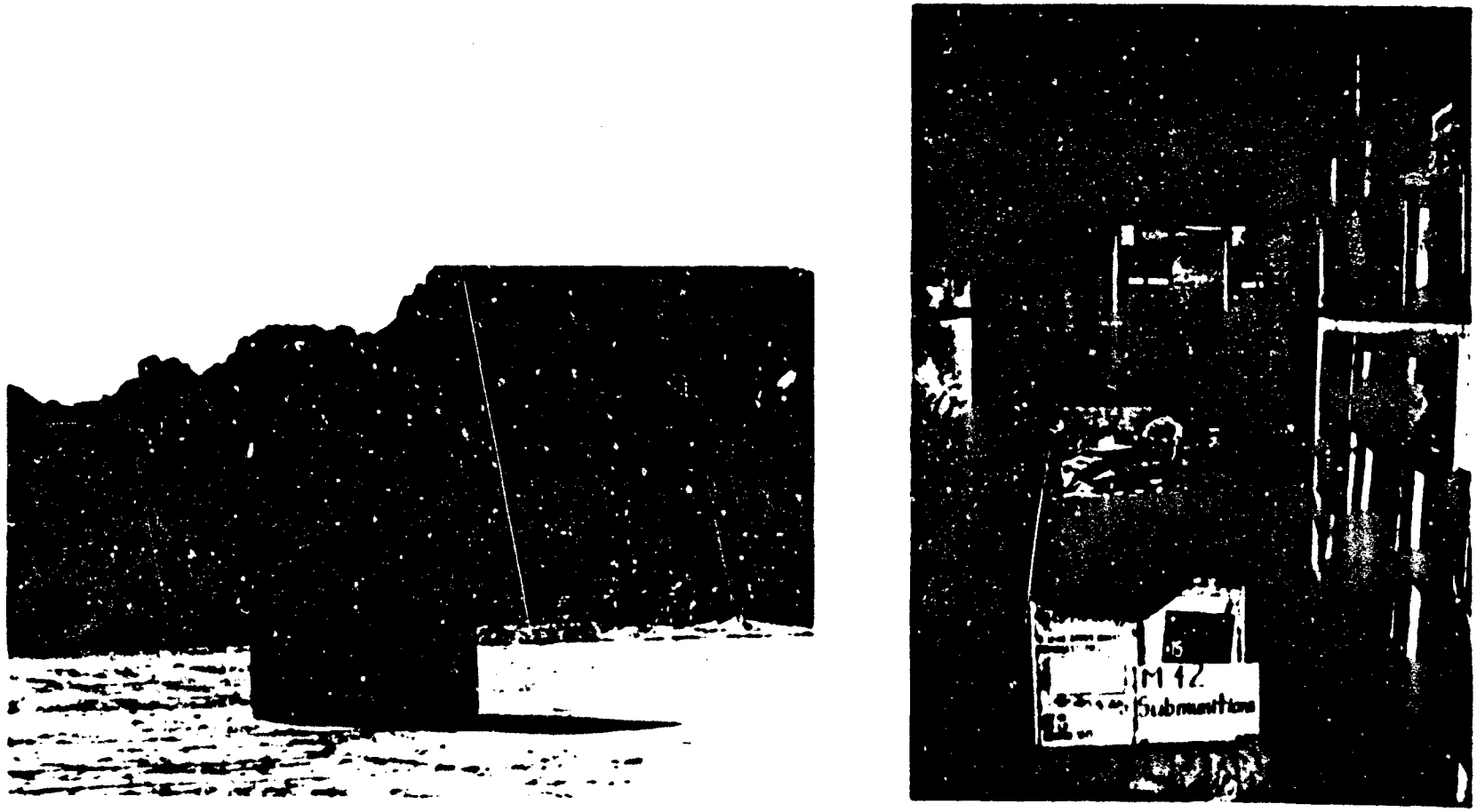

Figure 1. A Conex Container (Left) and Ammunition in the Container (Right), Test 1.

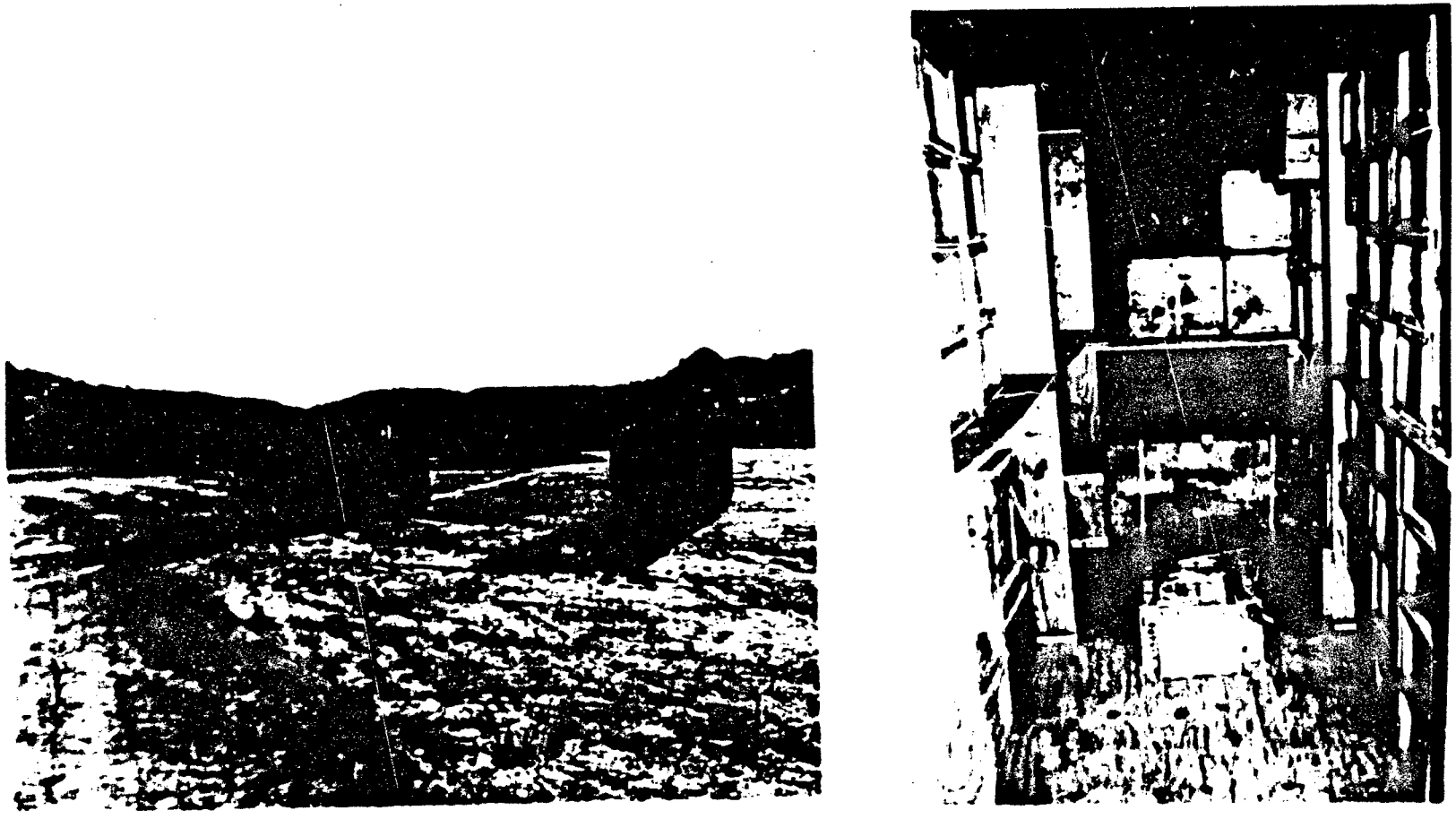

Figure 2. Donor and Acceptor Containers (Left) and Ammunition in the Container (Right), Test 2.

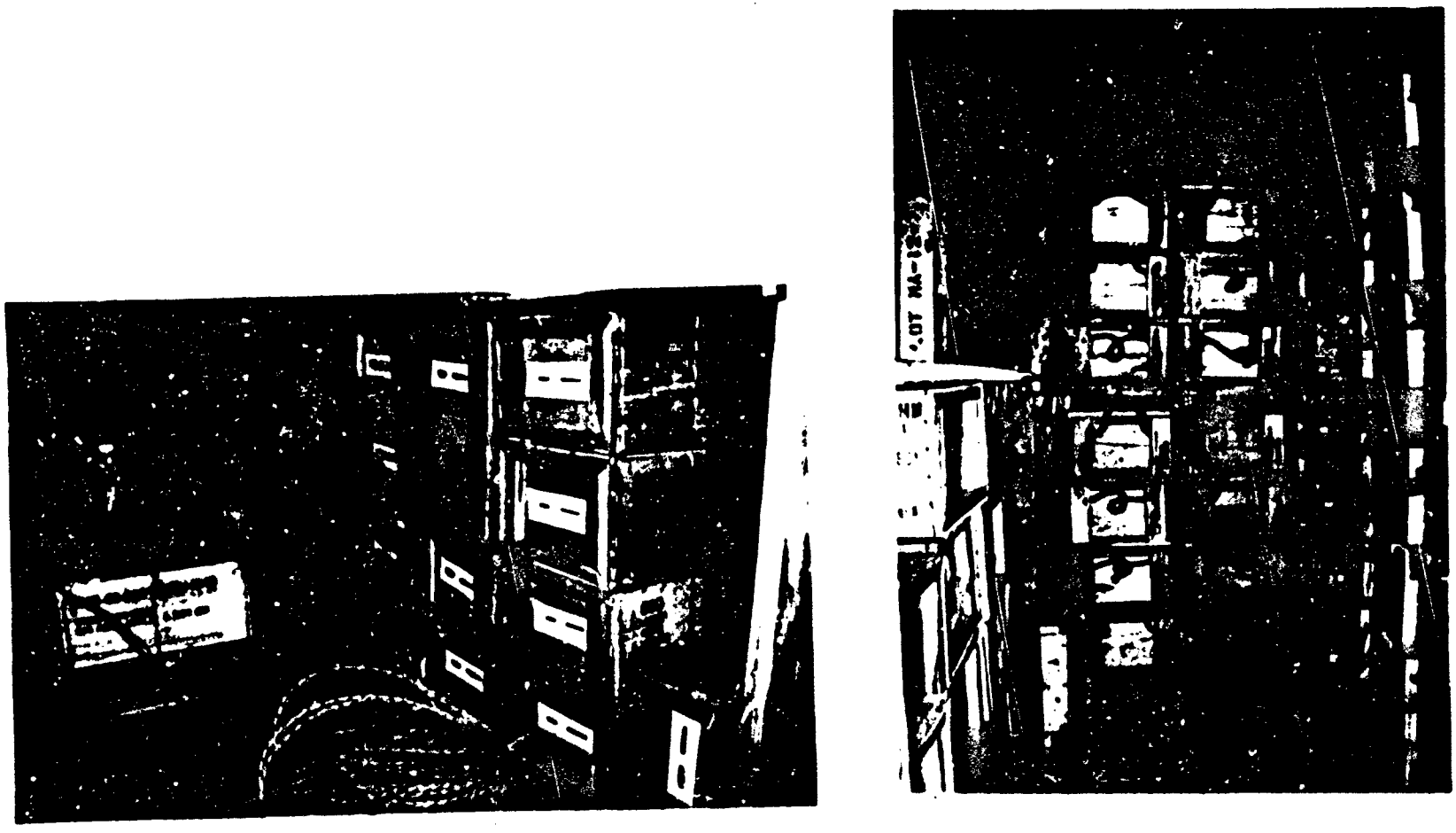

Figure 3. Mines with Prime-A-Cords (Left) and Other Ammunition in the Container (Right), Test 3.

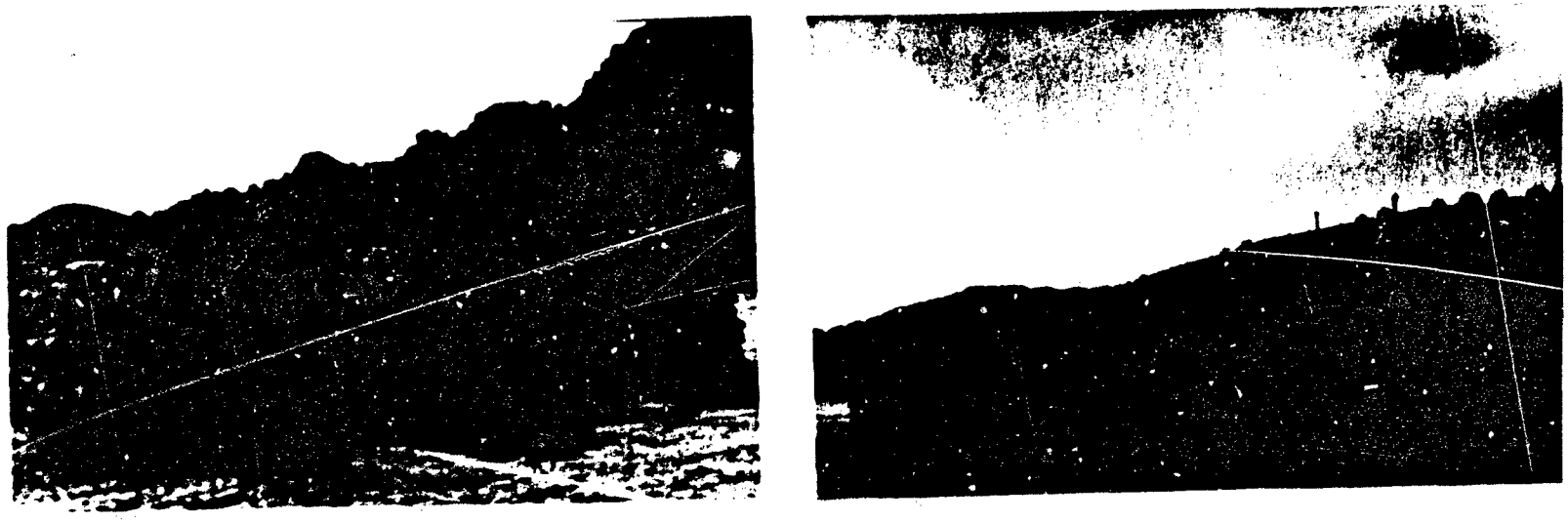

Figure 4. Donor and Acceptor Containers Confined by Sandbag Walls. Front Side (Left) and Back Side (Right) of the Walls, Test 4.

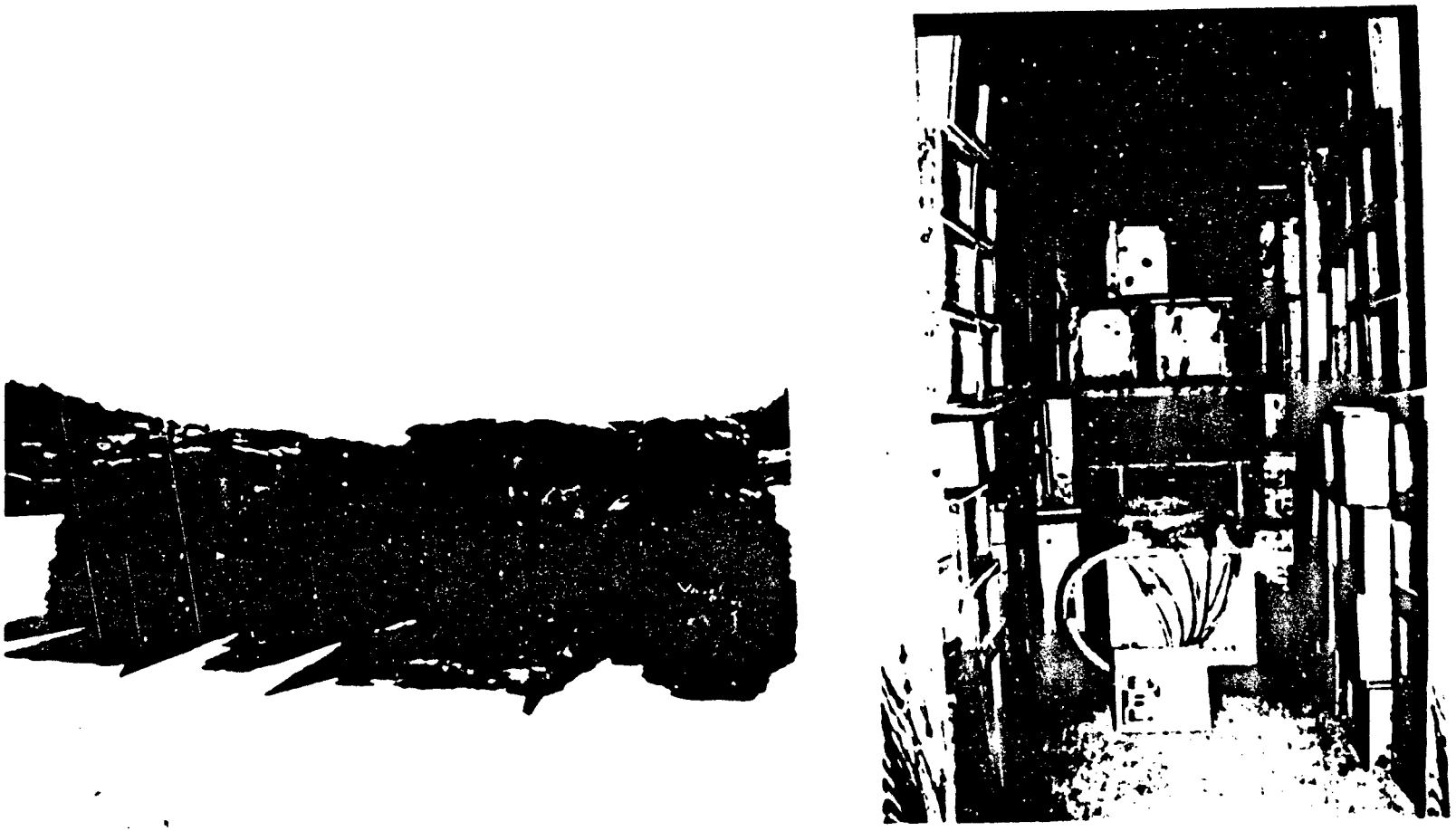

Figure 5. Donor and Acceptor Containers (Left) Confined by the Sandbag Walls and Ammunition Inside the Donor Container (Right), Test 5.

Figure 6. Donor and Acceptor Containers (Left) and Munitoins in the Donor Container (Right).

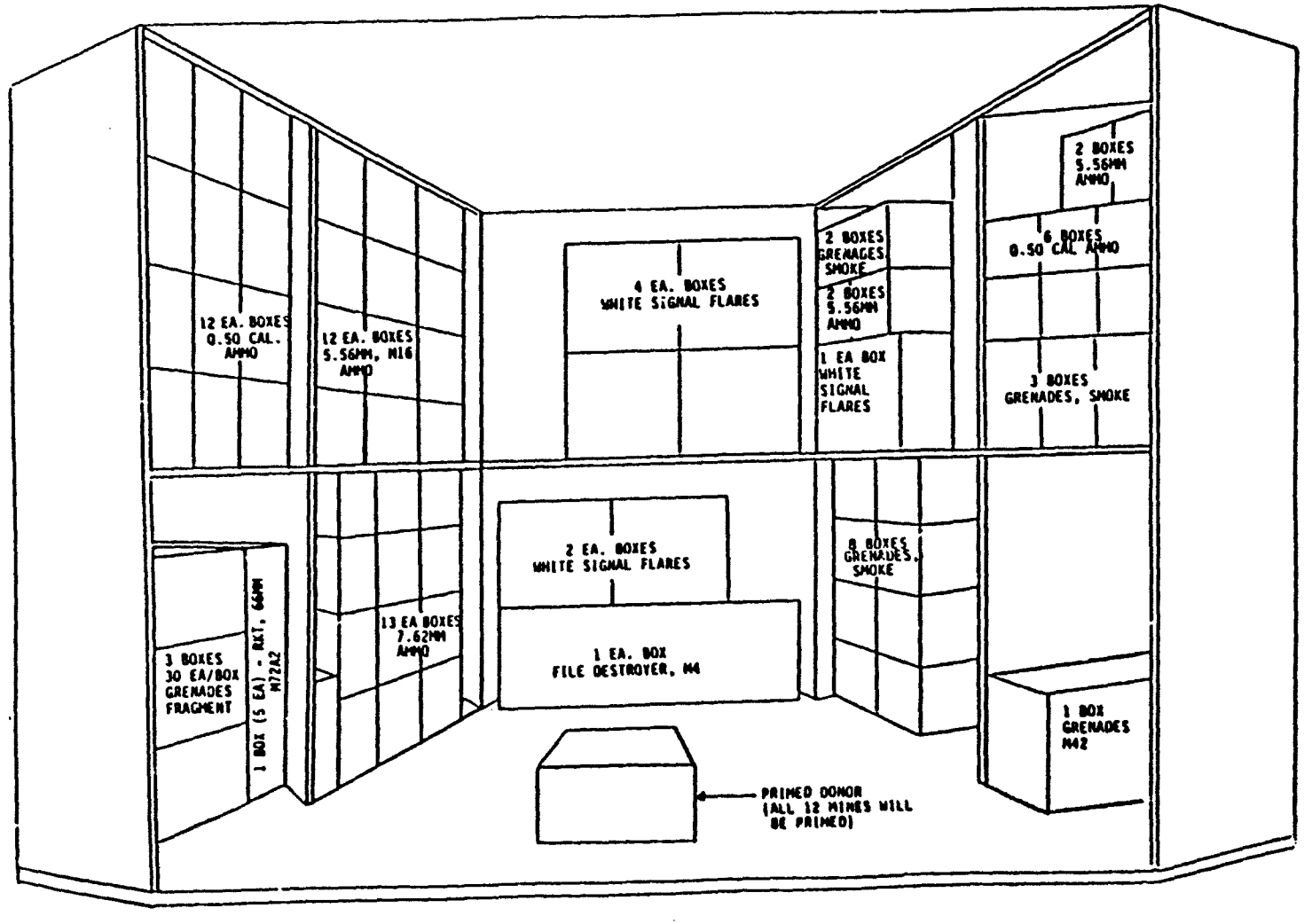

Figure 7. Ammunition in the Container, Test 7 and Test 8.

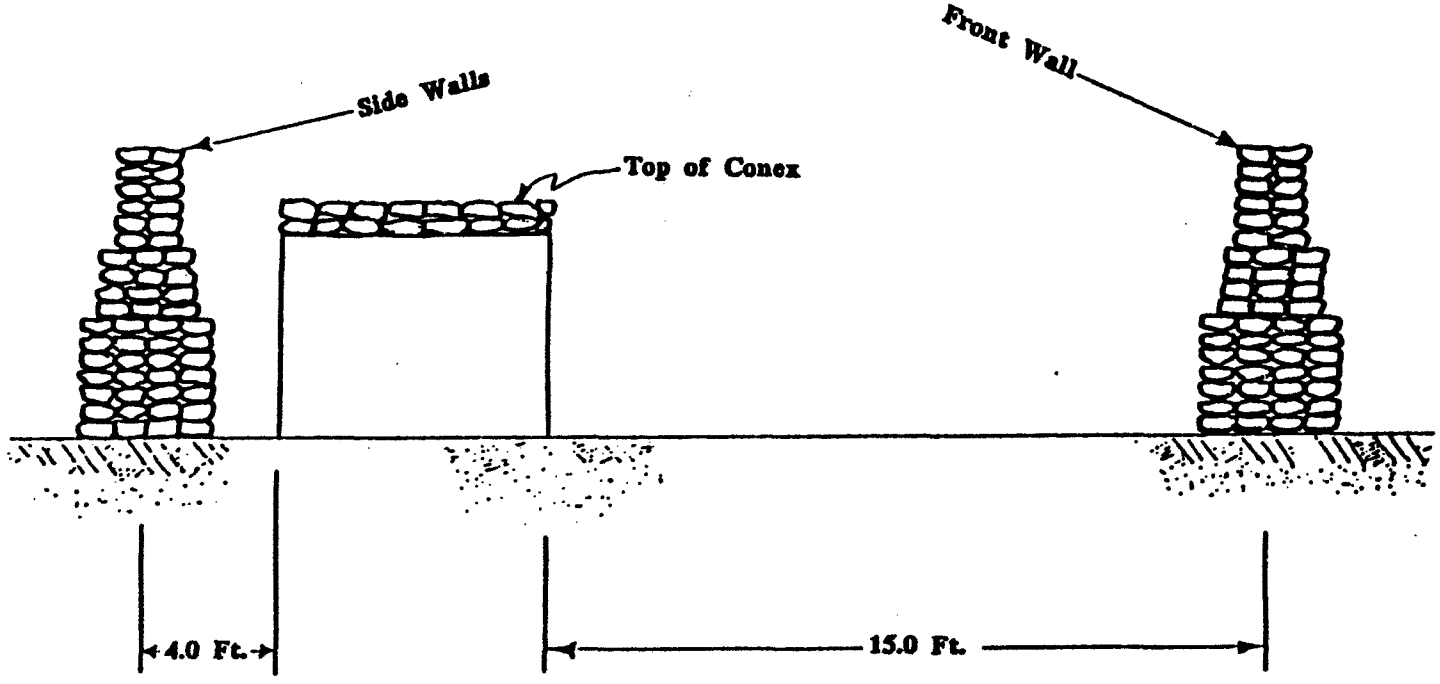

Figure 8. Sandbag Walls Configuration, Test 7 and Test 8.

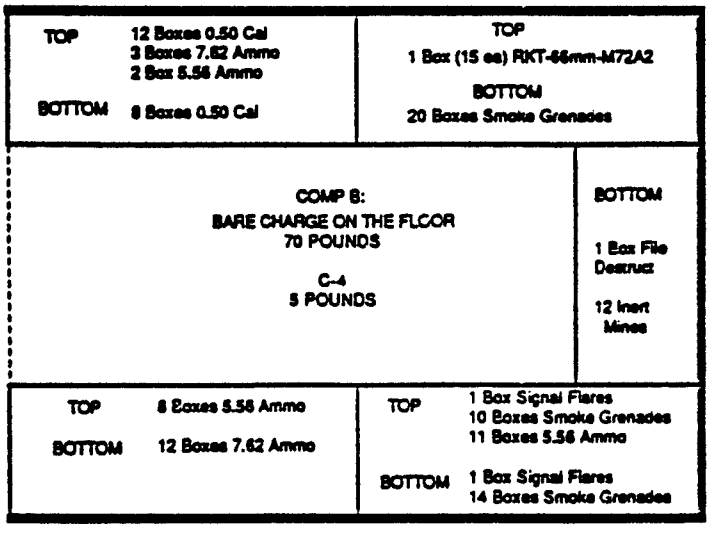

Figure 9. Ammunition in the Container, Test 9.

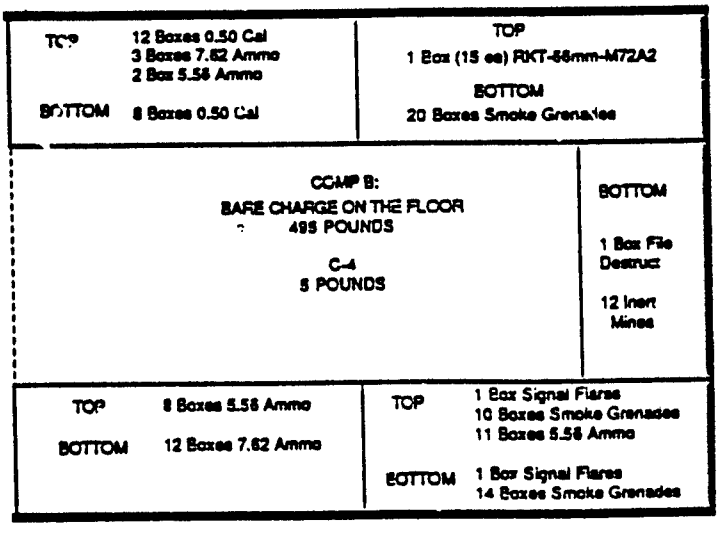

Figure 10. Ammunition in the Donor Container, Test 10.

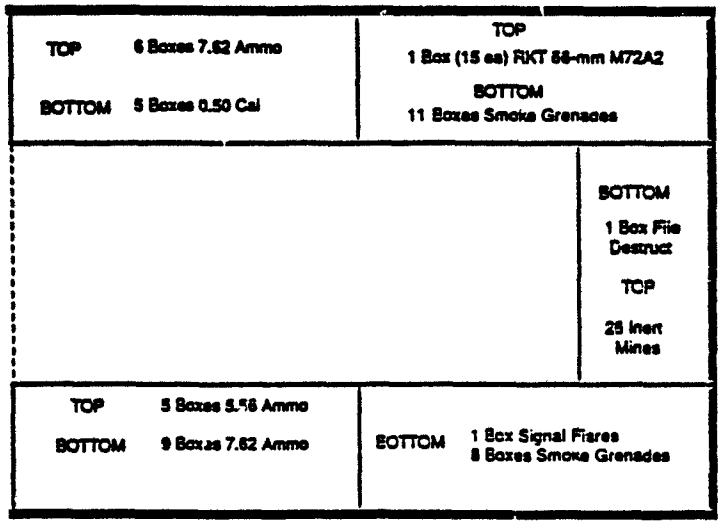

Figure 11. Ammunition in the Acceptor Container, Test 10.

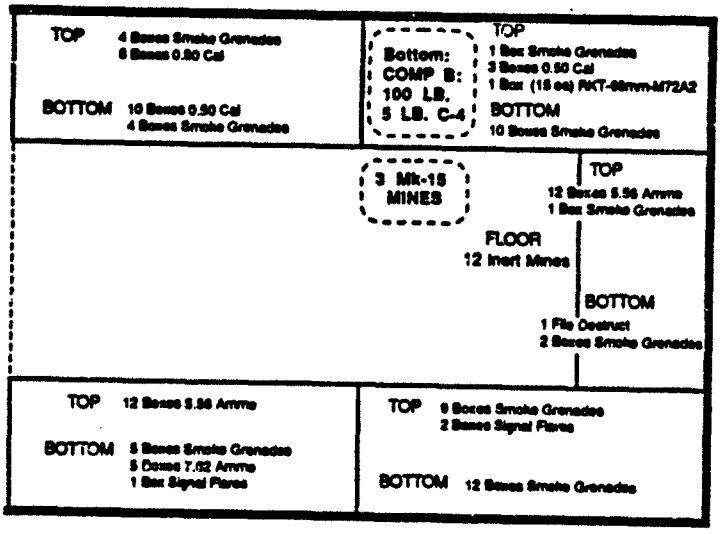

Figure 12. Ammunition Placement in the Container, Test 11.

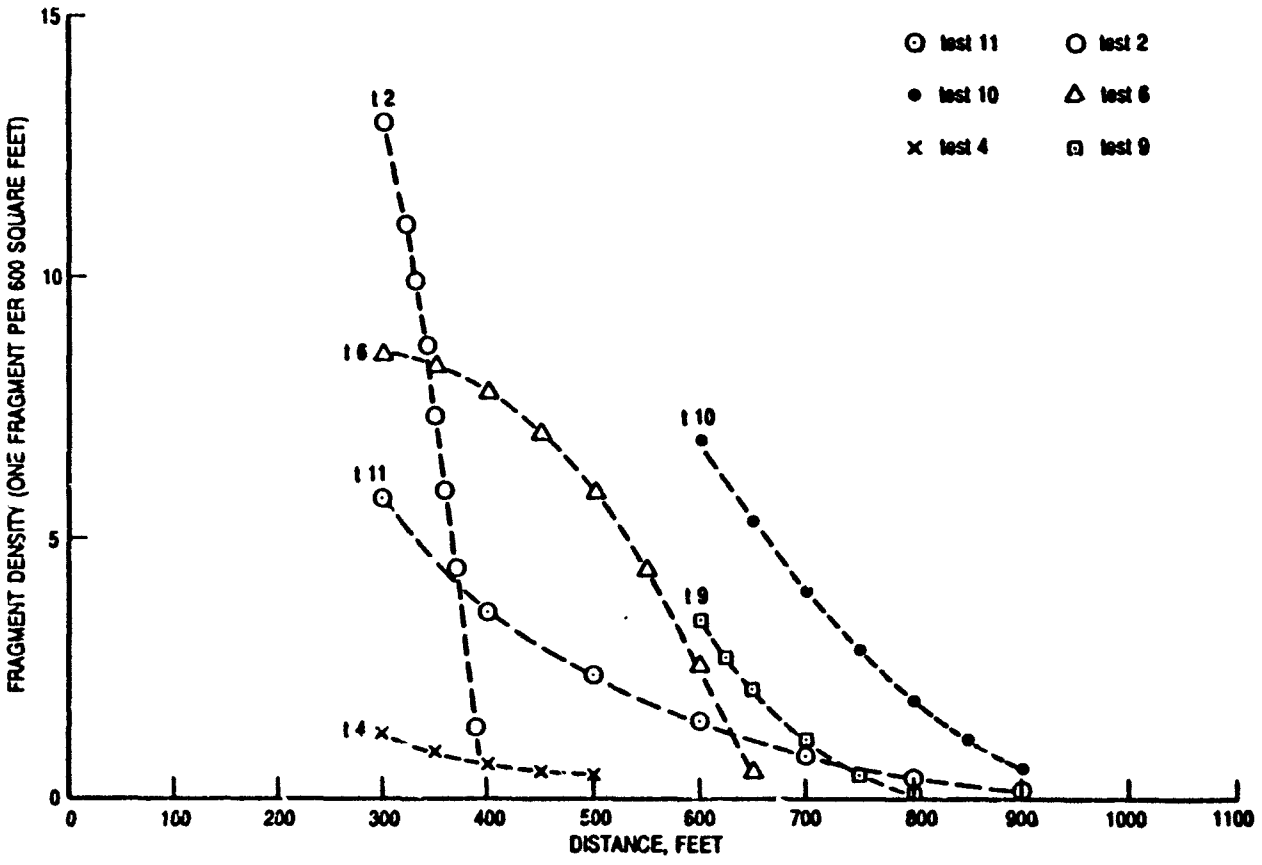

Figure 13. Fragment Density vs. Distance Plot.

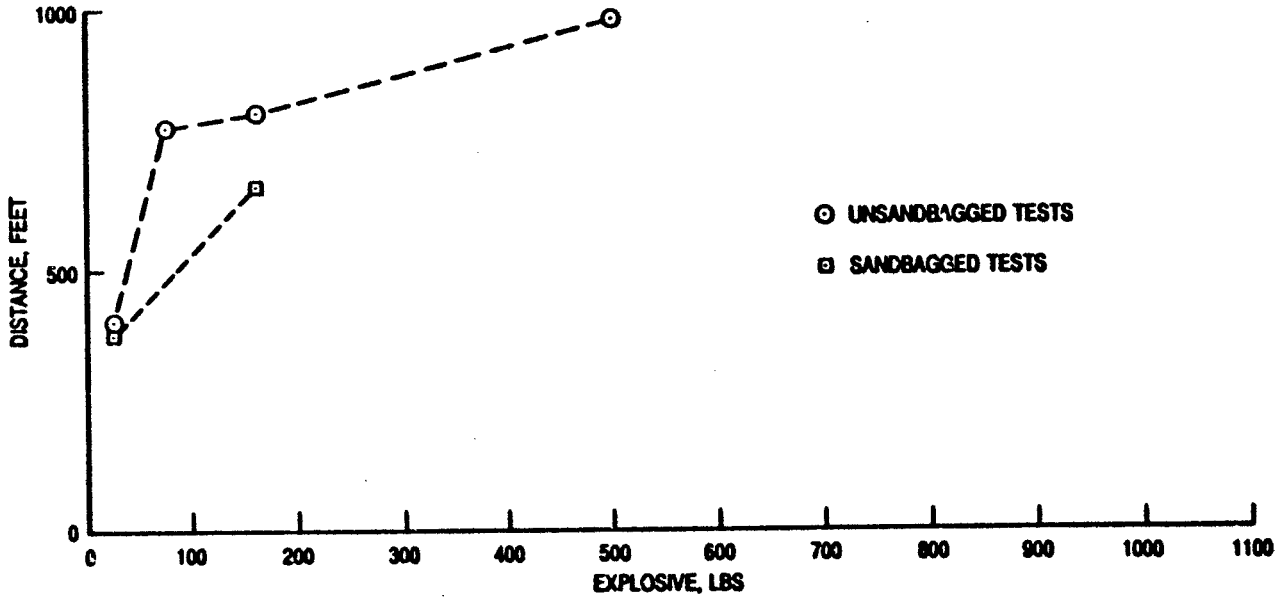

Figure 14. Distance vs. Explosive Weight Plot.

Table 1. A Typical Basic Load of Ammunition Stored in a Conex Container

CTG Cal .45 Ball	1,360 Rds
CTG .50 Cal	1,800 Rds
CTG 5.5-mm Ball M16	23,600 Rds
CTG 5.56-mm Tracer M16	4,930 Rds
CTG 7.62-mm Ball and Tracer Lined	9,370 Rds
CTG 40-mm M433	144 Rds
Grenade Fragmentation M67	195 Ea
Grenade Smoke Green	8 Ea
Grenade Incendiary	130 Ea
Grenade Smoke Red	8 Ea
Grenade Smoke HC	8 Ea
Grenade Smoke Voilet	10 Ea
Grenade Smoke Yellow	8 Ea
Fire Starter	8 Ea
Grenade Launcher Smoke Screening	8 Ea
Signal Illum Grenade	36 Ea
RKT 66-mm M72A2	15 Ea
Mines M18A1	12 Ea
File Destroyer M4	1 Ea
Signal Illum Ground Red Star	72 Ea
Illum Star Ground White	72 Ea
Signal Illum Ground Green Star	72 Ea

Table 2. Ammunition in a Conex Container

CTG, Cal .45 Ball and .50 Cal	3,160 Rds
CTG, 5.56-mm Ball/Tracer M16	28,530 Rds
CTG, 7.62-mm Ball and Tracer Lined	9,370 Rds
Grenade, Fragmentation M67	195 Ea
Grenade, Smoke	175 Ea
RKT, 66-mm M72A2 (unfuzed)	15 Ea
Mines, M18A1	12 Ea
File Destroyer, M4	1 Ea
Signal, Illum Ground	260 Ea
Rifle Grenade, M42	216 Ea

Table 3. Conex Test 1

Zone	A	B	C	D	E	F	G	H	I	J	K	L
9	1-MF									1-MF 5-FG		1-MF
8	2-MF		10-SG 29-M42 1-MF	25-SG 7-M42 1-MF			4-MF			5-FG		1-MF
7	1-MF		1-SG 4-M42 1-MF	4-SG 2-M42			1-MF 1-WF					1-MF
6		1-MF				1-MF	2-MF 1-WF 2-FDF			12-FG	1-MF	2-MF
5			27-M42	4-SG						2-MF 7-FG 1-WPF		2-50c
4		1-MF	9-M42 2-SG	5-SG 2-MF	4-SG	1-MF 1-WF	1-FDF	1-MF	9-FG 1-66 13-WPF	1-FG 1-WPF 5-MF	4-SG	2-50C 3-MF
3			15-M42 8-SG 1-WF	7-SG 1-M42	2-SG 1-M42	1-FDF 1-SG 3-WF	2-FDF		400-762 3-FG	400-762 1-FG		1-MF 1-WF
2	3-WF		1-SG	4-SG	5-SG 1-M42 2-WF	2-FDF 7-SG 1-MF	8-FDF		10-WPF 15-FG 200-762	2-MF 200-762	1-50C	1-WF
1	1-WF	1-WF	2-SG	5-66 17-S 1-MF 1-M42	6-SG	11-FDF 5-SG 1-MF		4-WP 6-SG 1-FG	1-FG 2-WPF 1-WF	1-WF		
0	84-M42 24-SG 3500-50 10-66			1-FG 50-SG 2-M42			1-MF, 24800-762 131-FG, 203-WPF			2-MF 387-762		

Table 3. Conex Test 1 (continued)

MUNITION, DISTANCE AND ANGLE DESIGNATION FOR CONEX TESTS			
Munition	**Designation**	**Munition**	**Designation**
0.50	50	File Dest. M4	FDF
7.62-mm	762	RKT 66-mm M72A2	66
5.56-mm	556	Metal Frag - Conex	MF
M42 Submunition	M42	Wood Frag.	WF
Frag Grenade	FG	Burned Munition	B
Smoke Grenade	SG	Casing	C
White Signal Flare	WPF	Projectile	P
White Signal Flare Part	WPFP	Casing/Projectile	C/P
5-M42 = Five rounds of M42			
Distance	**Designation**	**Distance**	**Designation**
0 - 60 ft	0	60 - 90 ft	1
90 - 120 ft	2	120 - 150 ft	3
150 - 180 ft	4	180 - 210 ft	5
210 - 240 ft	6	240 - 270 ft	7
270 - 300 ft	8	>300 ft	9
Distance	**Designation**	**Distance**	**Designation**
0 - 30 deg	A	30 - 60 deg	B
60 - 90 deg	C	90 - 120 deg	D
120 - 150 deg	E	150 - 180 deg	F
180 - 210 deg	G	210 - 240 deg	H
240 - 270 deg	I	270 - 300 deg	J
300 - 330 deg	K	330 - 360 deg	L

Table 4. Conex Test 2

ZONE	A	B	C	D	E	F	G	H	I	J	K	L
9		1-MF	28-M42	6-M42 22-SG 1-MF				1-MF	1-MF 12-FG	5-556 2-FG		
8	3-MF	2-M42	6-M42 4-SG 2-MF	2-MF 2-SG			1-MF		1-FG 1-M42	76-556 4-FG		
7	2-MF		5-M42 1-MF	3-MF	1-SG				1-MF 1-66P	820-556 1-FG		
6	2-MF	1-M42	1-MF 4-M42	1-MF 1-M42 2-SG	2-SG		1-MF	1-66C	4-FG	1-MF 48-556 1-FG	1-50	1-MF
5	3-MF		7-M42	2-SG	1-SG	1-MF			3-FG	200-556	1-66W	
4	3-MF		9-M42 1-SG	2-MF 3-M42 4-SG		1-MF 1-66W	2-MF		9-FG	1-MF 1-FG 1-WF 15-556	1-M42	1-MF
3	1-MF 1-WF	1-MF	1-MF 5-M42	1-MF 1-66P 3-SG 1-M42	1-66P 1-FG 1-WF	1-66L 3-556 1-WF	1-66P 2-FG 3-MF		14-FG	1-MF 24-556 1-WF	5-556	1-MF
2	1-MF	1-M42 2-W	1-MF 7-M42	5-SG 3-M42 1-SG	1-MF 1-SG	4-SG 1-WF	8-FDF	1-WPF	8-FG	60-556 1-FG	2-50 38-556	1-WF
1	2-M42 1-WF		26-M42 1-WF	10-SG 1-66	4-SG 1-66P	8-SG	20-FDF 1-SG 1-M42 1-WPF	1-WPF 1-WF	2-FG 2-WF	49-556 1-MF	30-556 4-50 1-FG	4-556 1-50 3-M42 1-MF
0	2800-50, 40-M42,	5-SG 1-FG		150-50, 11-66, 114-SG 1-FG, 2-M42, 2-66P 1-MF, 1-WF			2460-556, 200-762, 9-50 216-WPF, 110-FG, 9-FDF 2-SG, 1-MF			9400-762, 22140-556, 40-50 13-M42, 3-FG, 8-MF, 5-WF		

Table 5. Conex Test 3

ZONE	A	B	C	D	E	F	G	H	I	J	K	L
9		12-M42 2-MF 1-SG	23-M42 1-SG	2-M42						1-FG 2-WF		6-MF
8			8-M42						1-MF 1-FG	2-FG 1-762P		3-MF
7	1-MF		14-M42 3-MF	1-M42B 5-M42 1-WF 6-MF	1-M42B	1-MF 1-FDFP				2-FG		
6	2-MF	1-762C 1-M42 2-MF	9-M42 1-MF	4-SG 5-M42 3-MF		1-MF	1-FDF		2-FG 1-66P		1-50P	3-MF
5	3-MF 1-762C	1-762C 2-MF	9-M42 1-MF	5-M42 2-SG 1-MF		1-WPF 1-MF	1-FDF	1-MF	2-FG	1-MF		
4	6-MF 1-WF 3-762C	1-762C	1-66P 3-M42 1-MF	2-SG 2-M42 1-WF 1-MF		1-WF	1-FDFP		1-556B 3-762C 1-762	2-MF 1-FG	1-762P 1-762C	3-762C 2-MF 1-WF
3	2-MF	2-M42 1-WF	5-M42 2-MF	2-M42 5-SG	1-SG	2-WF	1-WPFB 1-FDFP 1-FG	1-WF	1-FG 1-MF	3-762P 3-556C 1-556P	1-556C 1-556 1-WF	1-MF
2	1-MF	3-M42 1-762B 1-MF 3-WF	1-M42B 2-M42 1-MF 4-WF	8-SG 3-M42 1-WF	1-SG	1-MF 1-FDF	8-FDF 2-MF 1-WF	3-762	1-762 1-556B	1-556B 1-WF 4-556B 2-762B	1-FG 1-MF	2-MF 2-762B
1	2-MF	3-M42 3-WF	17-M42 1-WF 1-MF	13-SG 9-762B 2-WF	1-SG 1-MF	11-FDFP 10-SG 1-WPF 1-WPFB 1-WF	15-FDFP 4-WPF 2-MF 1-WF	5-556B 1-FG	14-FG 1-762B 2-556B		5-556B 1-762B 1-WF	
0	1-WPFB, 1-SG, 1-MF, 1-WF 1-M42, 1-66, 3600-50			32-WPF, 24-WPFB, 1-FDFP 1-M42, 159-SG, 3-66B, 10-66			1-WPFB, 192-WPF, 58-FGB 215-762, 5-762B, 4-MF 61-FG, 1640-556B			5000-762, 21320-556B 2460-556, 5059-762B 43FGB, 9-FG, 3-WF		

Table 6. Conex Test 4

ZONE	A	B	C	D	E	F	G	H	I	J	K	L
9	1-MF 561 ft 1-66WH		1-MF 450 ft									1-MF 369 ft
8					1-M42							
7	2-50C 3-50P	1-MF 2-50P		1-WPF								
6	1-MF 8-50C/P 1-762P 1-556C	10-50C/P 1-556P 1-WPF 1-762P	1-M42 1-WPFC 7-762P			1-50P	1-MF			1-MF	13-50C/P 1-762C 1-SG 1-M42	4-50C 1-762P
5	1-50P 1-WPFC 2-762P	1-WPFP 2-762P/C 2-50P/C	2-50P	3-50P 2-556P/C 1-WPFC		1-50P 1-50V				3-50C 1-762C	1-50C	8- 50C/P 1-MF
4	1-WF 3-50P 1-WPFP 1-762P 1-556C	2-50P 2-50C 2-762P	3-50C 3-50P 2-762P	2-50C 1-50P 1-M42C 3-556p	2-50P					3-50C/P 1-556P	1-50C	5-50C
3	2-MF 3-50P 1-M42 4-50C	6-50C 1-50P 1-WPFC	7-50C 3-50P 1-SG 1-WPF 1-762P	1-556P 1-50C	2-50C 1-50P 1-556P	2-50C 1-MF 1-762C	2-50C/P 3-762C 1-MF	1-50C 1-M42	3-50C 1-50P	6-50C/P 1-762C 2-MF	7-50C	7-50C 1-50P
2	1-MF 13-50P/C 1-M42 1-556C 1-762C 1-WF	3-50C 5-50P 1-MF 1-WPFC 1-556P	3-M42 1-SG 8-50C/P 1-556P 2-762P	2-50C 2-50P 1-556C 1-WPF	2-50C	1-50C 1-50P 1-556P 1-SGC	3-50C 1-50P 1-762P 1-762C	3-50C 1-50P	8-50C 3-50P 2-WPF 1-SG	2-762C 1-762P 1-50C 1-MF 2-556C	1-50C 1-762C 2-556C 1-SG 1-MF	1-50C 1-WF
1	9-50C/P 3-762C 1-MF 1-WF	9-50C/P 1-M42 5-762C 1-WPFC	7-50C 1-WPFC 1-50P 6-556C	5-50C 2-50P 2-556P 1-556C	4-50C 1-50P 2-762P 1-556P	1-762P 1-50C 1-50P	3-50C 3-5CP 1-762C 1-MF	5-50C 3-50P 1-762P	3-50C 2-50P 1-762C 1-WPFC	7-50C 3-50P 1-WPF 3-762C	5-50C 1-M42 1-762P	3-M42 2-50C 1-66 1-SG 1-WPF
0	38-SG, 2-SGB, 1-WPF, 10-FG 4-WPFB, 61-FGB, 86-M42 7-66, 1-66P			57-WPF, 25-50, 3-SG, 3-M42 1-66, 1-FG, 6-762C, 1-WF 5-556C. 1-M42C, 1-MF			91-WPF, 4-FDFP, 2-M42 39-FG, 20-50, 18-SG		78-FG, 33-WPF, 26-WPFB 5-M42, 366, 10-SG, 1-SGB 19680-556B, 8000-762B			

Table 7. Conex Test 5

ZONE	A	B	C	D	E	F	G	H	I	J	K	L
9						1-WPF	1-WPFP					2-WPFP
8	5-50C/P					3-WPF				3-50C/P 3-WPFP 1-M42P	2-50P 2-WPFP 1-M42P	
7	2-WPFP 3-50P	4-50P			1-WPF			1-50P		1-50P 1-50C 3-WPFP		4-50C/P 1-762P 2-WPFP
6	2-50C 2-50P 1-762C	2-50C/P 1-762C 1-WPFP			2-50P 1-M42CP	1-WPF			1-50P 1-WPFP		1-50P 1-50C	4-50P 2-50C
5	2-50P 2-50CP 1-WPF	2-50P 2-WPF 1-M42P		1-WPF		1-50P	1-50C		3-50C	1-50P 1-M42P	1-50P 2-50C 2-556P	6-50C/P 1-556P 1-762C 2-WPF
4	5-50C/P 2-WPFP		1-WPF	1-66P		1-50C 1-762P			2-50P 1-762C 1-WPFP	3-50C/P 1-556P 1-762C	4-50C	3-50P 3-50C 1-M42P
3	4-50P 2-50C 1-WPFP	1-556P 3-50P 2-WPFP	2-556C/P 2-50C/P 2-WPFP 1-M42P	1-50P 1-WPFP	1-50C 1-762P 2-WPFP	1-556P 1-762P 1-50C 1- WPFP	3-50C	2-50C 1-WPFP		1-50P 3-WPFP 2-M42P	4-50C 1-556C 1-M42CP	9-50C/P 1-M42P 1-WPFP
2	1-MF 5-50P 1-50C 1-WPFP	2-556C 1-50C 6-WPFP	1-556P 2-50P 1-WPFP 1-M42CP	1-WPFP	2-762P 1-762C 2-WPFP	2-50C/P 1-556C 2-762P 1- WPFP	1-50P	1-50P 1-50C 3-WPFP	1-50P 3-50C 2-WPFP	1-556P 2-50P 2-50C 2-WPFP 2-M42P	2-50P 4-50C 2-556P 1-556C 2-WPFP	1-M42P 5-50C/P 1-762C 4-WPFP 1-DOOR
1	4-556C/P 3-762C/P 16-50C/P 5-WPFP	3-556C 2-50P 3-WPFP 1-M42P	1-556C 1-50P 1-762P 2-WPFP	1-50P 2-WPFP	2-50C 1-762P 1-WPFP 1-M42P	1-50P 1-762C 1-50C 1-762P	1-556C 1-50P 2-50C 1-WPFP	2-50C 3-WPFP	3-50P 8-50C 3-WPFP 1-M42P	1-556C 5-50C 2-WPFP 1-M42P	5-50P 7-50C 3-556C 4-WPFP	19-50C/P 2-556C/P 1-WPFP 2-M42P
0	2-MF, 25-556C, 5-556P, 12-50 114-50C, 52-50P, 6-762C 1-762P, 60-WPFBP, 2-M42B 2-M42P, 1-66BP			2-50, 8-50C, 3-50P, 1-556P 4-556C, 5-762P, 1-SG, 4-M42P, 43-WPFP			6-50P, 21-50C, 1-762P 13-WPFP, 3-M42, 4-M42P 3-66P			1-50, 106-50C, 123-50C, 4-SG 3-556, 5-556P, 71-556C, 1-762C, 5-762P, 80-WPFBP 5-M42P, 5-M42, 8-M42B		

Table 8. Conex Test 6

ZONE	A	B	C	D	E	F
4	1-MF 2-ABF 1-SG 30-556 76-50	1-ABF 123-50 2-556 1-MF	3-ABF 93-762 95-50 2-SG	1-ABF 2-WPF 1504-556 16-762 6-50	1-SG 1-50CB	2-SG 1-WPF
3	214-50 46-556 1-762CB 1-SG	2-ABF 47-50 1-762CB	6-ABF 8-SG 488-50 144-762 1-MF	3-ABF 2-SG 2582-556 423-762 11-50	3-WPF 1-SG 1-50P	5-WPF 4-SG
2	315-50 2-556 1-762CB 2-ABF	3-ABF 156-60 2-762CB	5-ABF 295-762 538-50 3-SG	4-ABF 2-50P 823-556 2429-762	520-556 2-50P 2-762P 3-WPF 1-SG	9-SG 2-WPFP 1-50 1-MF
1	97-50 1-762P 4-ABF 4-MF	4-ABF 5-762CB 439-50 1-WPF	2-ABF 4-SG 232-50 25-762	2-MF 13-ABF 2930-762 1-SG 18-50 3-WPF 943-556	1-MF 1-ABF 1-FDF 2-WPF 1-SG 1-762 1-50CB	1-ABF 3-WPF 3-FDF 11-SG 1-MF
0	12-SG, 134-WPF, 262-50 148-50CB, 281-50P, 24-762P 1-556P, 41-762, 56-762CB 3-556CB, 1-556, 17-ABF 47-WF, 6-MF			10661-556, 3-556P, 38-556CB 34-50CB, 67-50P, 412-762P 5-50, 443-762CB, 3025-762 52-WPF, 35-SG, 33-FDF 14-ABF, 13-MF, 63-WF		

Table 8. Conex Test 6 (continued)

ZONE	A	B	C	D	E	F	G	H	I	J	K	L
9	1-ABF 54-50 707-556 13-FM	1-ABF 32-50P 2-SG 1-WPF 13-MF	2-MF 2-SG 25-50P 4-556 2-762	740-556	100-556							30-50CB 1-MF
8	1-ABF 673-556 19-50 1-MF	35-50P 6-50CB 4-MF		1423-556 5-50 1-50CB	109-556 2-556CB 1-556P						2-50P 51-50C	13-50CB 1-50 1-MF
7	1-ABF 217-556 1-762P 8-50 1-MF	820-557	2-ABF 7-SG 121-50 10-556 7-762 1-MF	1-ABF 1-WPF 79-556	2-SG 2-50P 3-M42F 2-WPFP 1-MF		1-MF 2-50CB 1-SG				4-50P 7-50CB	6-MF
6	208-556 1-SG 3-ABF 51-50 3-MF	1-SG 12-50 3-762CB 553-556 1-ABF 1-MF	7-SG 36-556 13-762 52-50	81-556 1-WPF 1-ABF			2-50C/P 1-SG 1-50 1-MF				7-50CB	2-MF 1-50P 46-50CB 1-50
5	2-ABF 13-50P 45-556 57- 50CB	10-50P 6-50CB 2-556 2-MF	6-ABF 6-ABF 160-50 167-762 2-556	2-ABF 1-50P 1598-556 1-556P	820-556 1-SG 2M42P					8-50CB	34-50CB 1-50 1-50P	6-50P 6-50 79-50CB 2-MF
4							7-SG			62-50CG 2-50P	1-50 23-50CB	7-50P 3-50 77-50CB 1-MF
3							7-SG		7-50C	23-50CB 1-50	17-50CB 1-50P 1-MF	10-50 12-50P 85-50CB
2							7-SG			12-50CB 1-50P 2-50P 2-50C 2-WPFP 2-M42P	22-50CB	7-50P 5-50 36-50CB
1							2-MF 10-SG	1-SG 1-MF	1-MF	9-50CB 3-50P 1-MF	2-MF 20-50CB 2-50P	21-50CB 1-50 3-50P 1-SG 1-MF
0							15-SG, 1-ABF, 4-WPF 3-50CB, 10-MF			23-50P, 3-ABF, 52-50CB 45-50, 41-WPF, 16-SF, 4-MF		

Table 9. Conex Test 7

ZONE	A	B	C	D	E	F	G	H	I	J	K	L
9	2-50P	3-FG									1-FG	
8	10-FG 2-WPFB 4-50P 1-MF			2-50P 2-50C						2-50P	8-50P 1-MF	
7	1-MF 4-FG 1-WPFB			2-50P 1-50C 1-M42	3-50P					1-50P 1-50C	1-FG 1-50P	
6	5-FG 12-50P 5-50C		4-50P	1-50C	7-50P 1-50C		1-WF			2-MF 2-50P 1-762P	1-WPF 2-50P 2-MF	9-50P,C 5-762P,C 1-WPF
5	1-FG 1-WPFB	4-50C 1-556P 4-50P	3-50C 4-50P	3-50C 1-50P	3-50C	5-50P 1-50C 2-WPFB	2-WPF 1-WPFB			3-50C 1-WPF	4-50C 2-50P 1-762C	2-50C 3-50P 1-WPFB
4	1-FG 7-50P,C 2-MF 1-WPF	2-50C 3-50P 1-762C	3-50P 1-762C	3-50C 4-50P	3-50P 1-50C	1-50C 2-50P	3-50C 1-WPF		5-50P,C 1-M42 1-WPF 2-MF	2-50C 1-MF	2-50P 1-762C 2-762P 4-50C	1-50C 1-50P 1-MF
3	6-FG 8-50C 3-50P	1-762C 4-50C 4-50P	13-50C 1-50P 1-762C 1-M42P	5-50C 2-50P	5-50C 2-50P	4-50C 1-WPF	3-50C 1-WPF	1-WPF 2-50C	4-50P,C 5-WPF 1-556C	6-50P,C 4-762P,C 1-WPF	5-50C 1-762P 3-50P	3-5-P,C 1-762P 1-762C
2	4-FG 9-50P,C 2-762P	13-50P,C 1-WPFB 1-762P	5-50C 2-762C 7-50P	8-50C 3-50P 1-WPF	3-50C 5-50P 1-WPFB	6-50C 1-50P	1-50P 1-WPFB	4-50C 2-WPFB 8-WPF	6-50P,C 4-WPFB	1-50P 1-50C 1-WPF	4-50P,C 1-762C 1-M42	13-50P,C 3-WPFB 1-M42
1	5-FG 6-50P,C 1-762P	19-50P,C 2-762P,C 1-FG	11-50C 5-50P 1-WPFB	5-50C 6-50P	5-50C 3-50P	1-556C 3-50C 2-50P	6-50C 4-50P	3-WPFB 4-50C 3-50P	1-50C 1-WPF	5-50P,C 1-WPF 1-M42	17-50P,C 4-762P,C 2-WPF	12-50P,C 2-762P,C 2-WPF
0	8 BOXES-50, 439-50, 20 BOXES-5.56, 41 BOXES-7.62, 47-SG, 3-M42, 41-FG, 154-WPF, 2-66 W/H, 4-66 MTR						3 BOXES-7.62B, 2 BOXES-5.56B, 5 BOXES-50B, 75-SG/SGB 1-FG, 38-M42, 32-WPFB/WPF					

Table 10. Conex Test 9

ITEM NO	BEARING DEG/MIN/SEC	DISTANCE FEET (M)	DESCRIPTION/SIZE
1	351/37/03	530.6 (161.7)	BUILDING FRAGMENT - 4' BY 5'
2	349/50/25	636.6 (194.0)	BUILDING FRAGMENT - 1' BY 7'
3	351/14/33	663.8 (202.3)	SMOKE GRENADE
4	358/44/50	663.3 (202.2)	SMOKE GRENADE
5	0/25/46	657.7 (200.5)	SMOKE GRENADE
6	1/3/16	625 (190.5)	BUILDING FRAGMENT - 8" BY 8"
7	1/11/09	698.2 (212.8)	SMOKE GRENADE
8	5/52/06	689.6 (210.2)	SMOKE GRENADE
9	7/54/26	701.3 (213.8)	SMOKE GRENADE
10	8/25/05	618.5 (188.5)	SMOKE GRENADE
11	83/31/34	625.4 (625.4)	CHAIN LINK DIVIDER MATERIAL FOR FILE DESTRUCT
12	163/20/55	605.7 (184.6)	SMOKE GRENADE
13	185/10/21	619.8 (188.9)	SMOKE GRENADE
14	183/34/58	604.7 (184.3)	SMOKE GRENADE
15	265/30/20	739 (225.2)	BUILDING FRAGMENT - 2' BY 2.5'
16	273/27/55	637.5 (194.3)	BUILDING FRAGMENT - 5' BY 8'
17	278/03/45	623.5 (190.0)	BUILDING FRAGMENT - 3' BY 3'
18	277/33/47	678.3 (206.8)	BLDG FRAG - 6" BY 18" AND DOOR HANDLE 18" APART
19	272/36/02	650 (198.1)	HASP FROM DOOR LATCH
20	272/07/32	767.8 (234.0)	DOOR LATCH ROD - 1" BY 2'
21	272/57/59	784.8 (239.2)	BUILDING FRAGMENT - 2' BY 2'
22	278/21/57	823.9 (251.1)	BUILDING FRAGMENT - 4" BY 18"
23	284/18/09	775.7 (236.4)	BUILDING FRAGMENT - 6" BY 3'
24	286/37/49	652.8 (199.0)	BUILDING FRAGMENT - 2' BY 3'
25	296/13/05	905.8 (276.1)	SECTION OF DOOR LATCH MECHANISM
26	304/52/52	605.8 (184.6)	BUILDING FRAGMENT - 1.5" BY 6"
27	328/54/41	603.4 (183.9)	BUILDING FRAGMENT - 2' BY 3'
28	343/14/34	632 (192.6)	SMOKE GRENADES (2) - 5' APART ON ROADWAY
29	341/44/48	631.2 (192.4)	SMOKE GRENADE - ON ROAD
30	345/00/48	608.4 (185.4)	SMOKE GRENADE
31	336/05/31	340.7 (103.8)	BUILDING FRAGMENT - 1.5' BY 2.5', SM BLDG FRAG SHARDS
32	335/04/16	446.2 (136.0)	BUILDING FRAGMENT - 8" BY 1'
33	352/58/38	370 (112.8)	BUILDING FRAGMENT - 3' BY 2'
34	352/29/44	442.2 (134.8)	BLDG FRAGS (3) - 2 @ 2' BY 7', 1 @ 6" BY 8"
35	9/10/46	372.7 (113.6)	BUILDING FRAGMENT - 3' BY 5'
36	1/42/29	295.2 (90.0)	BUILDING FRAGMENT - 2.5' BY 4'
37	33/21/55	346.5 (105.6)	BUILDING FRAGMENT - 2' BY 2'
38	39/21/55	311.2 (94.9)	BUILDING FRAGMENT - 1' BY 5'
39	37/30/22	296.5 (90.4)	BUILDING FRAGMENT - 1' BY 2' (JUST INSIDE 300' ARC)
40	44/30/47	293.5 (89.5)	BUILDING FRAGMENT - 1' BY 2' (JUST INSIDE 300' ARC)
41	54/46/11	360 (109.7)	BUILDING FRAGMENT - 2' BY 2'
42	71/27/15	315.8 (96.3)	BUILDING FRAGMENT - 2' BY 7'
43	86/41/34	323.4 (98.6)	BLDG FRAGS (3) - 6" BY 18", 2' BY 5.5', 1" BY 6'
45	75/31/41	568.1 (173.2)	CHAIN LINK DIVIDER MATL, BLDG FRAG @ 4" BY 1'
46	142/58/10	417.8 (127.3)	SMOKE GRENADE
47	159/14/01	448.5 (136.7)	BUILDING FRAGMENT - 1" BY 6'
48	166/40/08	378.5 (115.4)	BUILDING FRAGMENT - 2' BY 2.5'
49	172/34/11	342.7 (104.5)	BUILDING FRAGMENT - TWISTED - 8" BY 8'
50	190/35/25	313.9 (95.7)	BLDG FRAG - 1" BY 6', 2 BOXES 7.62 AMMO
51	241/14/08	463.3 (141.2)	BLDG FRAGS - 1 @ 2' BY 4', MANY SMALL FRAGMENTS
52	255/16/18	427 (130.1)	BUILDING FRAGMENT - 3' BY 5.5', PART OF DOOR LATCH
53	256/36/33	566 (172.5)	BUILDING FRAGMENT - 3' BY 3'
54	275/29/31	546.1 (166.5)	BLDG FRAGS (4) - AVERAGE 4" BY 4'
55	283/57/50	360.8 (110.0)	DOOR FRAME - 1.5' BY 6' WITH SECTION OF WALL

Table 10. Conex Test 9 (continued)

ITEM NO	BEARING DEG/MIN/SEC	DISTANCE FEET (M)	DESCRIPTION/SIZE
56	279/53/47	438.1 (133.5)	BUILDING FRAGMENT - 2' BY 2.5'
57	292/58/15	447.8 (136.5)	BUILDING FRAGMENT - 6" BY 6'
58	305/02/59	320.1 (97.6)	BLDG FRAGS - ASSORTED SMALL STEEL PIECES
59	324/04/04	453.3 (138.2)	BLDG FRAGS (2) - 1 @ 1.5' BY 2.5', 1 @ 1.5' BY 2'
60	326/53/09	522.8 (159.3)	BUILDING FRAGMENT - 3" BY 2'
61	335/05/31	340.7 (103.8)	REPEAT OF #31
62	335/04/16	446.2 (136.0)	REPEAT OF #32
63	345/59/48	214.3 (65.3)	BUILDING FRAGMENT - TWISTED - 2' BY 5'
64	358/34/40	207.2 (63.2)	SKID FROM BASE OF CONEX
65	9/2/35	221 (67.4)	BUILDING FRAGMENT - 1.5' BY 2'
66	44/14/31	294.3 (98.7)	BUILDING FRAGMENT - 1' BY 2' (REPEAT?)
67	83/17/55	121.3 (37.0)	BUILDING FRAGMENT - TWISTED - 5' LONG, ERRATIC WIDTH
68	88/51/35	185.2 (56.4)	BUILDING FRAGMENT - 1.5' BY 1.5'
69	76/27/08	271.9 (82.9)	BUILDING FRAGMENT - 1.5' BY 2.5'
70	100/11/24	225.1 (68.6)	BUILDING FRAGMENT - TWISTED - 2' BY 5'
71	142/08/09	195.4 (59.6)	BUILDING FRAGMENT - 6" BY 3'
72	135/24/43	159.8 (48.7)	BUILDING FRAGMENT - 6" BY 2.5'
73	156/28/34	231.2 (70.5)	BUILDING FRAGMENT - 8" BY 3'
74	176/20/12	241.2 (73.5)	BLDG FRAG - 5' BY 6' - BLDG S/N D-0503085
75	178/09/01	222.3 (67.8)	SECTION OF BLDG SKID - 3.5' LONG
76	178/34/10	201.9 (61.5)	SECTION OF BLDG SKID - 5' LONG
77	174/40/30	174.7 (53.2)	BUILDING FRAGMENT - 1.5' BY 3.5'
78	185/13/16	189 (57.6)	BUILDING FRAGMENT - 8" BY 2.5'
79	187/28/25	258.7 (78.9)	BUILDING FRAGMENT - 3.5' BY 5'
80	213/19/08	238.2 (72.6)	BUILDING FRAGMENT - 8" BY 3'
81	219/08/40	208.9 (63.7)	BUILDING FRAGMENT - 6' BY 5'
82	227/09/33	210.9 (64.3)	BUILDING FRAGMENT - 1.5' BY 2'
83	231/11/14	200.5 (61.1)	BUILDING FRAGMENT - TWISTED - 1' BY 3.5'
84	229/26/21	76.6 (23.3)	BUILDING FRAGMENT - 1.5' BY 2'
85	243/48/51	66.4 (20.2)	BUILDING FRAGMENT - 2' BY 2.5'
86	255/20/23	93.3 (28.4)	DOOR LATCH ROD - 1" BY 3'
87	261/21/58	157.3 (47.9)	DOOR FRAME SECTION
88	255/19/04	234.8 (71.6)	DOOR FRAME SECTION?
89	280/28/12	226 (68.9)	BUILDING FRAGMENT - 1' BY 3.5'
90	283/02/23	238.9 (72.8)	BUILDING FRAGMENT - 6" BY 2.5'
91	285/41/24	286.3 (87.3)	BUILDING FRAGMENT - 8" BY 2'
92	291/58/03	264.2 (80.5)	BUILDING FRAGMENT - TWISTED - 2.5' BY 3'
93	293/03/46	216.8 (66.1)	BUILDING FRAGMENT - 1' BY 2'
94	293/12/28	169.4 (51.6)	BUILDING FRAGMENT - 1' BY 3'
95	254/46/34	22.9 (7.0)	BUILDING FRAGMENT - TWISTED & BURNED - 2' BY 7'
96	329/05/51	106 (32.3)	BUILDING FRAGMENT - 2.5' BY 2.5'
97	319/46/48	143.5 (43.7)	BUILDING FRAGMENT - TWISTED & BURNED - 6" BY 2'
98	306/31/36	128.3 (39.1)	BUILDING FRAGMENT - TWISTED - 8" BY 3'
99	316/09/44	165.7 (50.5)	BUILDING FRAGMENT - 10" BY 2'
100	304/37/19	250.8 (76.4)	BUILDING FRAGMENT - 2' BY 2'
101	338/45/26	262.3 (80.0)	BUILDING FRAGMENT - 6" BY 2.5'

Table 11. Conex Test 10

ITEM NO.	BEARING DEG-MIN-SEC	DISTANCE FEET (M)	DESCRIPTION / SIZE
1	97/12/33	625.7 (190.7)	BUILDING FRAGMENT - 1" BY 8"
2	346/28/42	658.6 (200.7)	BOX 50 CAL AMMO - BROKEN, SCATTERED
3	350/04/27	748.3 (228.1)	BUILDING FRAGMENT - TWISTED - 2" BY 3.5"
4	348/45/33	798.2 (243.3)	BUILDING FRAGMENT - STRIP - 1.5" BY 8"
5	335/04/38	687.4 (209.5)	BUILDING FRAGMENT - 13" BY 27"
6	332/12/50	1043.9 (318.2)	BUILDING FRAGMENT - TWISTED - 6" BY 12"
7	319/37/49	940.3 (286.6)	BUILDING FRAGMENT - 2.5" BY 2.5"
8	328/10/37	696.4 (212.3)	BUILDING FRAGMENT - 2" BY 3"
9	326/35/26	622.6 (189.9)	BUILDING FRAGMENT - STRIP - 1.5" BY 3"
10	316/41/38	783.8 (238.9)	BUILDING FRAGMENT - 1" BY 1"
11	299/41/23	599.2 (182.6)	DOOR FRAME WITH HINGE (GREEN-COLORED DONOR)
12	294/15/39	617.1 (188.1)	BUILDING FRAGMENT - TWISTED - 2" BY 3"
13	297/18/37	723.0 (220.4)	BUILDING FRAGMENT - 4" BY 8"
14	291/32/39	786.4 (239.7)	BUILDING FRAGMENT - 3" BY 18"
15	298/22/50	869.6 (265.1)	BUILDING FRAGMENT - 1.5" BY 2"
16	286/45/43	919.8 (280.4)	BUILDING FRAGMENT - 1" BY 16"
17	278/01/32	623.8 (190.1)	BUILDING FRAG - 4" BY 3" / DOOR LATCH ROD 1" BY 3"
18	281/32/02	661.7 (201.7)	BUILDING FRAGMENT - 6" BY 6"
19	277/31/17	679.8 (207.2)	BUILDING FRAG - 6" BY 1.5" / DOOR HANDLE (GREEN)
20	280/26/43	746.6 (227.6)	BUILDING FRAGMENT - 3" BY 7"
21	281/55/24	815.6 (248.6)	BUILDING FRAGMENT - 4" BY 6"
22	275/44/54	827 (252.1)	BUILDING FRAGMENT - 6" BY 1.5"
23	274/04/18	751.7 (229.1)	BUILDING FRAGMENT - 6" BY 1"
24	269/26/26	695.4 (212.0)	BUILDING FRAGMENT - 3" BY 8"
25	268/50/32	675.5 (205.9)	BUILDING FRAGMENT - 4" BY 6"
26	265/29/24	738.4 (225.1)	BLDG FRAGS (2) 1- 3" BY 3.5" 1 - 2" BY 6"
27	261/30/42	763.3 (232.7)	BUILDING FRAGMENT - 3" BY 3"
28	272/37/24	649.5 (198.0)	CLUSTER 3 SMALL BLDG FRAGS AND NWC LOCK HASP
29	272/58/16	1138.3 (347.0)	DOOR LATCH ROD - 1" BY 3"
30	259/15/33	940.9 (286.8)	BUILDING FRAGMENT - TWISTED - 6" BY 1"
31	244/38/52	692.7 (211.1)	BUILDING FRAGMENT - 1" BY 2"
32	234/43/12	604.2 (184.2)	DOOR HINGE
33	243/20/57	1155.7 (352.3)	BUILDING FRAGMENT - TWISTED - 6" BY 14"
34	232/48/10	688.6 (209.9)	FOUR LINKED 50 CAL ROUNDS
35	225/19/48	589.5 (179.7)	DOOR FRAME (GREEN)
36	225/20/12	678.9 (206.3)	1 BOX 7.62 AMMUNITION
37	223/02/38	665.9 (203.0)	9 ROUNDS 7.62 AMMUNITION
38	215/25/44	612.9 (186.8)	1 BOX 7.62 AMMO AND SCATTERED ROUNDS
39	214/34/48	707.9 (215.8)	BUILDING FRAGMENT - 6" BY 1"
40	212/17/43	764.3 (233.0)	1 BOX 7.62 AMMUNITION
41	218/37/39	754.5 (230.0)	1 BOX 7.62 AMMUNITION
42	225/54/56	1120.5 (341.5)	BUILDING FRAGMENT - 1.5" BY 1"
43	214/52/33	930 (283.5)	1 BOX 7.62 AMMUNITION
44	203/32/52	675.4 (206.0)	BUILDING FRAGMENT - TWISTED - 1" BY 2"
45	204/00/54	722.6 (220.4)	BUILDING FRAGMENT - TWISTED - 6" BY 6"
46	209/58/37	1100 (335.3)	1 BOX 7.62 AMMO - 6" FROM 1100' HUB ON 210 DEG RADIAL
47	180/07/08	900 (374.3)	1 SMOKE GRENADE AND 2 FLARES
48	162/56/14	735.8 (224.3)	BUILDING FRAGMENT - 6" BY 2"
49	166/42/52	693.6 (211.4)	BUILDING FRAGMENT - 2" BY 5"
50	169/39/52	678.8 (206.9)	BUILDING FRAGMENT - 6" BY 6"
51	156/12/44	733.1 (223.4)	BUILDING FRAGMENT - TWISTED - 6" BY 1.5"
52	131/07/45	663.7 (202.3)	BUILDING FRAGMENT - 4" BY 8"
53	120/38/35	602.1 (183.5)	BUILDING FRAGMENT - 6" BY 8"
54	115/23/11	619.9 (188.9)	BUILDING FRAGMENT - 6" BY 5"

Table 11. Conex Test 10 (continued)

ITEM NO.	BEARING DEG-MIN-SEC	DISTANCE FEET (M)	DESCRIPTION / SIZE
55	99/57/39	668 (203.6)	BUILDING FRAGMENT - 3" BY 1"
56	85/05/26	836 (254.8)	BUILDING FRAGMENT - 15" BY 18"
57	88/27/25	727.3 (221.7)	BUILDING FRAGMENT - 3" BY 1"
58	88/43/20	619.4 (188.8)	BUILDING FRAGMENT - 3" BY 1"
59	93/35/41	626.4 (190.9)	CHAIN LINK DIVIDER MATERIAL FOR FILE DESTRUCT
60	83/16/56	653.8 (199.3)	BUILDING FRAGMENT - 4" BY 1"
61	81/14/27	667.4 (203.4)	BUILDING FRAGMENT - 4" BY 18"
62	82/10/15	698 (212.8)	BUILDING FRAGMENT - 3" BY 18"
63	81/15/13	838.6 (255.7)	BUILDING FRAGMENT - 2" BY 15"
64	70/25/24	701.6 (213.9)	CHAIN LINK DIVIDER MATERIAL FOR FILE DESTRUCT
65	45/55/39	726 (221.3)	BUILDING FRAGMENT - 3" BY 1"
66	29/10/51	723.5 (220.5)	BUILDING FRAGMENT - 9" BY 1"
67	12/2/11	927.6 (282.7)	BUILDING FRAGMENT - 1' BY 3'
68	10/26/34	739.1 (225.3)	BUILDING FRAGMENT - 1' BY 2'
69	9/48/21	606.4 (184.8)	1 BOX 50 CALIBER AMMUNITION
70	6/51/50	605.7 (184.6)	BUILDING FRAGMENT - 6" BY 1"
71	12/2/11	927.6 (282.7)	REPEAT OF #67
72	3/55/51	1084 (330.4)	BUILDING FRAGMENT - 9" BY 9"
73	0/57/29	646.4 (197.0)	DOOR HINGE
74	359/46/47	695.6 (212.0)	1 BOX 50 CALIBER AMMO, BROKEN OPEN
75	351/25/49	558.1 (170.1)	BUILDING FRAGMENT - 1' BY 2'
76	348/19/51	460.9 (140.5)	BUILDING FRAGMENT - 2' BY 3'
77	291/26/19	532 (162.2)	BUILDING FRAGMENT - 2' BY 2'
78	263/44/11	320.7 (97.7)	BUILDING FRAGMENT - 6" BY 18"
79	269/35/41	304.1 (92.7)	1 BOX 7.62 AMMUNITION
80	250/09/41	433.7 (132.2)	BLDG FRAGS (2) - 1-6" BY 6"; 1-2' BY 4'
81	237/25/25	551.5 (168.1)	ACCEPTOR DOOR (WHITE)
82	231/36/08	527 (160.6)	ACCEPTOR DOOR (WHITE)
83	228/26/17	523.2 (159.5)	ACCEPTOR DOOR LATCH MECHANISM
84	224/53/43	436.7 (133.1)	ACCEPTOR DOOR FRAME
85	224/22/32	343.4 (104.7)	BUILDING FRAGMENT - 6" BY 6"
86	225/24/56	302.4 (92.9)	2 BOXES 7.62 AMMUNITION
87	186/07/54	389.1 (118.6)	ACCEPTOR WALL SECTION - 6' BY 6'
88	188/04/49	451.7 (137.7)	ACCEPTOR WALL SECTION - TWISTED - 3' BY 6'
89	195/27/46	425.3 (129.6)	BUILDING FRAGMENT - 2' BY 3'
90	195/36/00	318 (96.9)	ACCEPTOR DOOR FRAME WITH HINGES 1' BY 6'
91	186/42/49	355.6 (108.4)	ACCEPTOR DOOR FRAME - 1' BY 6'
92	181/55/41	358.5 (109.3)	1 BOX 5.56 AMMUNITION
93	180/59/12	457.3 (139.4)	BUILDING FRAGMENT - 1' BY 8'
94	152/47/22	465.7 (141.9)	BUILDING FRAGMENT 2' BY 4'
95	145/47/22	449.9 (137.1)	BUILDING FRAGMENT - 1.5" BY 3'
96	115/09/10	425.5 (129.7)	ACCEPTOR SIDE WALL - 6' BY 8'
97	49/06/30	597.5 (182.1)	BUILDING FRAGMENT - TWISTED - 1.5' BY 6'
98	50/23/17	474.5 (144.6)	ROCKET - BROKEN
99	40/42/09	480.2 (146.4)	2 ROCKETS (BROKEN), 1 SMOKE GRENADE WITHIN 15' RADIUS
100	22/18/09	345.8 (105.4)	1 ROCKET, BROKEN
101	5/48/18	346.1 (105.5)	1 BOX 7.62 AMMUNITION
102	346/26/02	309.2 (94.2)	1 BOX 5.56 AMMUNITION
103	246/57/10	258.8 (78.9)	BLDG FRAGS (2) - 1 - 2' BY 6"; 1 - 6" BY 5'
104	243/45/00	156.8 (48.4)	BUILDING FRAGMENT - 2' BY 6'
105	264/19/12	163.8 (49.9)	BUILDING FRAGMENT - 3' BY 6'
106	201/48/19	135.9 (41.4)	BUILDING FRAGMENT - 3' BY 6'
107	184/04/33	66 (20.1)	ACCEPTOR FLOOR AND SECTION OF WALL (WHITE)
108	201/01/31	291.2 (88.8)	BUILDING FRAGMENT - 3' BY 4'
109	121/03/01	274.3 (83.6)	BUILDING FRAGMENT - 1' BY 6'
110	49/41/11	58 (17.7)	BUILDING FRAGMENT - 1' BY 6'

Table 12. Calculation of Fragment Density, Test 2

Sector deg	R Distance ft	A Area ft^2	N1	N2
30-60	300	628.32	1	0.95
60-90	300	628.32	29	27.69
90-120	300	628.32	29	27.69
210-240	300	628.32	1	0.95
240-270	300	628.32	13	12.41
270-300	300	628.32	7	6.68
30-60	340	712.10	1	0 84
60-90	340	712.10	29	24.43
210-240	340	712.10	1	0.84
240-270	340	712.10	1	0.84
60-90	360	753.98	6	4.77
90-120	360	753.98	5	3.98
210-240	360	753.98	1	0.80
90-120	388	812.63	5	3.69

The following apply to Tables 12 through 18:

R = Radial Distance from Ground Zero
A = Vertical Area of the Sector = (3.414 x R x H)/12
H = Assumed Height = 8 ft
N1 = No. of Actual Fragments Found in that Sector
N2 = Fragment Density = (600 x N1)/A

Table 13. Calculation of Fragment Denity, Test 4

Sector deg	R Distance ft	A Area ft^2	N1	N2
0-30	300	628.32	2	1.91
60-90	300	628.32	1	0.95
330-360	300	628.32	1	0.95
0-30	400	837.76	1	0.72
60-90	400	837.76	1	0.72
0-30	561	1,174.96	1	0.51

Table 14. Calculation of Fragment Density, Test 6 (Sandbagged)

Sector deg	R Distance ft	A Area ft^2	N1	N2
0-30	300	628.32	13	11.46
30-60	300	628.32	13	11.46
60-90	300	628.32	2	1.76
210-240	300	628.32	1	0.95
30-60	400	837.76	13	9.31
30-60	500	1,047.20	10	5.73
30-60	600	1,256.64	2	0.95
30-60	673	1,409.53	1	0.43

Table 15. Calculation of Fragment Density, Test 9

Sector deg	R Distance ft	A Area ft^2	N1	N2
0-30	600	1,256.64	6	2.87
270-300	600	1,256.64	10	4.78
330-360	600	1,256.64	6	2.87
0-30	700	1,466.00	1	0.41
240-270	700	1,466.00	1	0.41
270-300	700	1,466.00	5	2.05
270-300	800	1,676.20	2	0.68
270-300	905	1,895.43	1	0.32

Table 16. Calculation of Fragment Density, Test 10

Sector deg	R Distance ft	A Area ft^2	N1	N2
0-30	600	1,256.64	7	3.34
60-90	600	1,256.64	9	4.30
210-240	600	1,256.64	10	4.78
270-300	600	1,256.64	15	7.16
0-30	700	1,466.00	4	1.64
60-90	700	1,466.00	4	1.64
210-240	700	1,466.00	5	2.05
270-300	700	1,466.00	9	3.68
0-30	800	1,676.20	2	0.72
60-90	800	1,676.20	2	0.72
180-210	800	1,676.20	2	0.72
210-240	800	1,676.20	3	1.07
270-300	800	1,676.20	2	1.79
240-270	800	1,676.20	2	0.72
300-330	800	1,676.20	2	0.72
330-360	800	1,676.20	1	0.36
0-30	900	1,885.70	2	0.64
180-210	900	1,885.70	2	0.64
210-240	900	1,885.70	2	0.64
240-270	900	1,885.70	2	0.64
270-300	900	1,885.70	2	0.64
300-330	900	1,885.70	1	0.32
330-360	900	1,885.70	1	0.32

Table 16. Calculation of Fragment Density, Test 10 (continued)

Sector deg	R Distance ft	A Area ft^2	N1	N2
0-30	1,000	2,095.20	1	0.29
180-210	1,000	2,095.20	1	0.29
210-240	1,000	2,095.20	1	0.29
240-270	1,000	2,095.20	1	0.29
270-300	1,000	2,095.20	1	0.29
330-360	1,000	2,095.20	1	0.29
180-210	1,100	2,303.84	1	0.26
210-240	1,100	2,303.84	1	0.26
240-270	1,100	2,303.84	1	0.26
270-300	1,100	2,303.84	1	0.26
240-270	1,155	2,419.03	1	0.25

Table 17. Calculation of Fragment Density, Test 11

Sector deg	R Distance ft	A Area ft^2	N1	N2
90-120	300	628.32	4	3.82
270-300	300	628.32	5	4.78
300-330	300	628.32	4	3.82
330-360	300	628.32	4	3.82
90-120	400	837.87	4	2.86
270-300	400	837.87	5	3.58
300-330	400	837.87	4	2.86
330-360	400	837.87	4	2.86
90-120	500	1,047.33	3	1.72
270-300	500	1,047.33	4	2.29
300-330	500	1,047.33	2	1.15
330-360	500	1,047.33	2	1.15
90-120	600	1,256.40	2	0.96
270-300	600	1,256.40	4	1.91
300-330	600	1,256.40	1	0.48
330-360	600	1,256.40	2	0.96
270-300	700	1,466.00	1	0.41
300-330	700	1,466.00	1	0.41
330-360	700	1,466.00	1	0.41
60-90	800	1,676.20	1	0.36
270-300	800	1,676.20	1	0.36
330-360	800	1,676.20	1	0.36
60-90	900	1,885.70	1	0.32
60-90	1,000	2,095.20	1	0.29
60-90	1,100	2,303.84	1	0.26

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AR 385-64, DoD Ammunition and Explosive Safety Standards.

DoD 6055.9 STD, DoD Ammunition and Explosive Safety Standards, July 1984.

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Lawrence, William. "Test Data on the Storage of Mixed Munitions in Conex Containers." Twenty-Fourth DOD Explosive Safety Seminar, St. Louis, MO, August 1990.

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APPENDIX

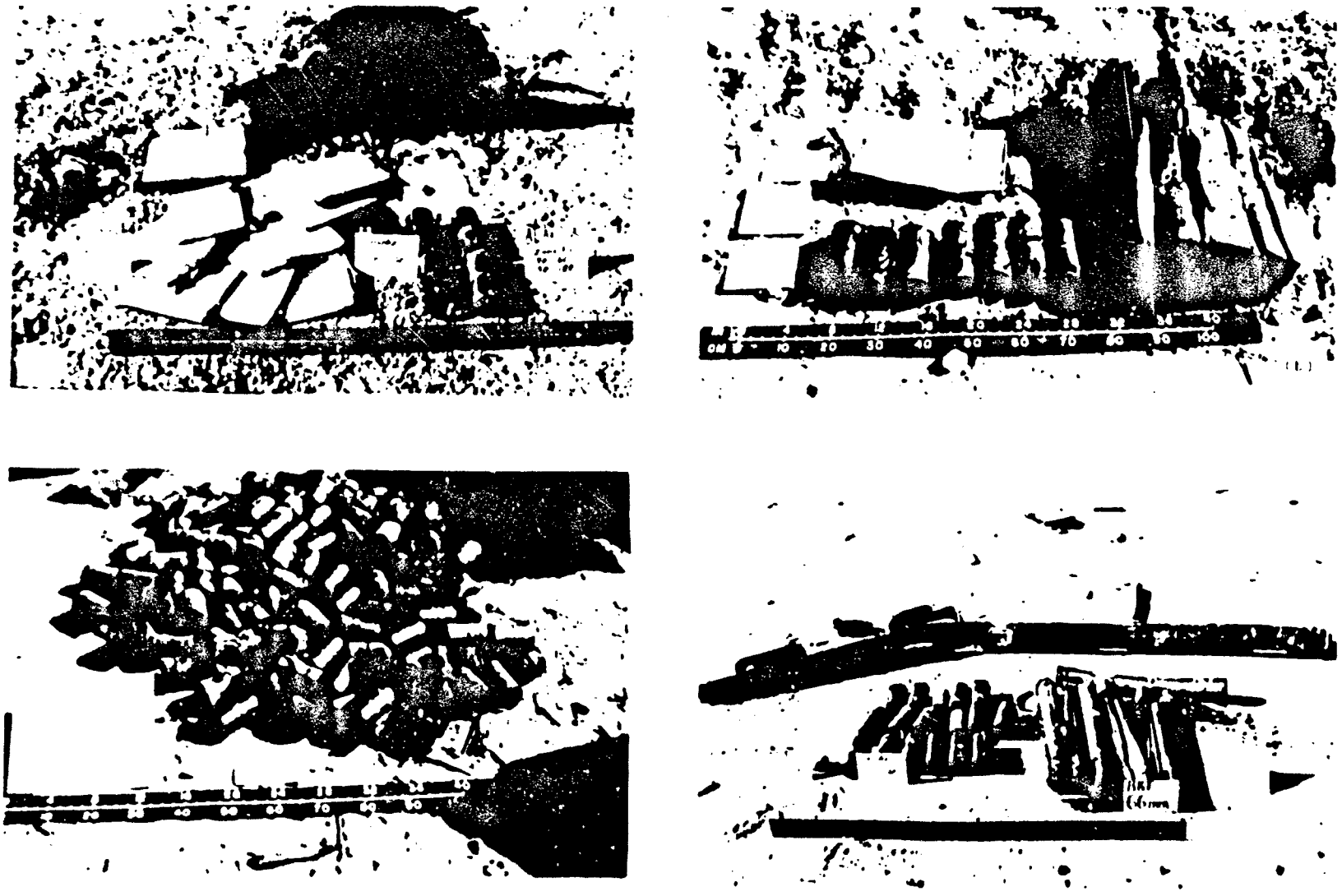

Figure A-1. Test 1. (a) File Destroyer, Conex, and Smoke Grenades; (b) Conex and Smoke Grenades; (c) Frag. Grenades; and (d) Smoke Grenades, M42 Submunition, 66-mm Rockets.

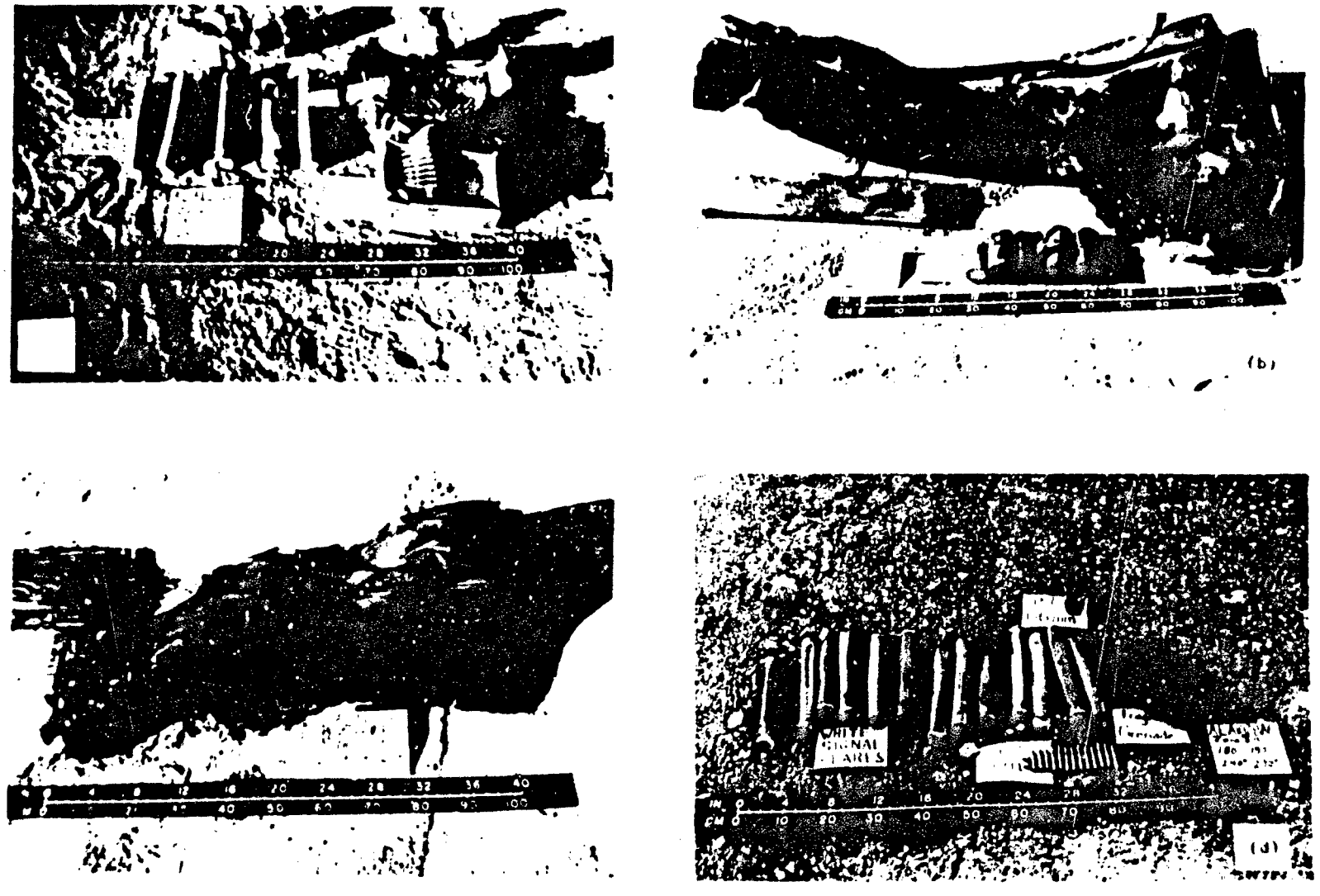

Figure A-2. Test 1. (a) Flares, Frag. Grenades, and 7.62 mm; (b) Container and Smoke Grenades; (c) Conex Part; and (d) Flares, 7.62-mm, Grenades and a Part of a Rocket.

Figure A-3. Test 2. (a) Acceptor Conex; (b) 7.62-mm, 50 Cal, Frag. Grenades; (c) Smoke Grenades; and (d) 66-mm Rocket.

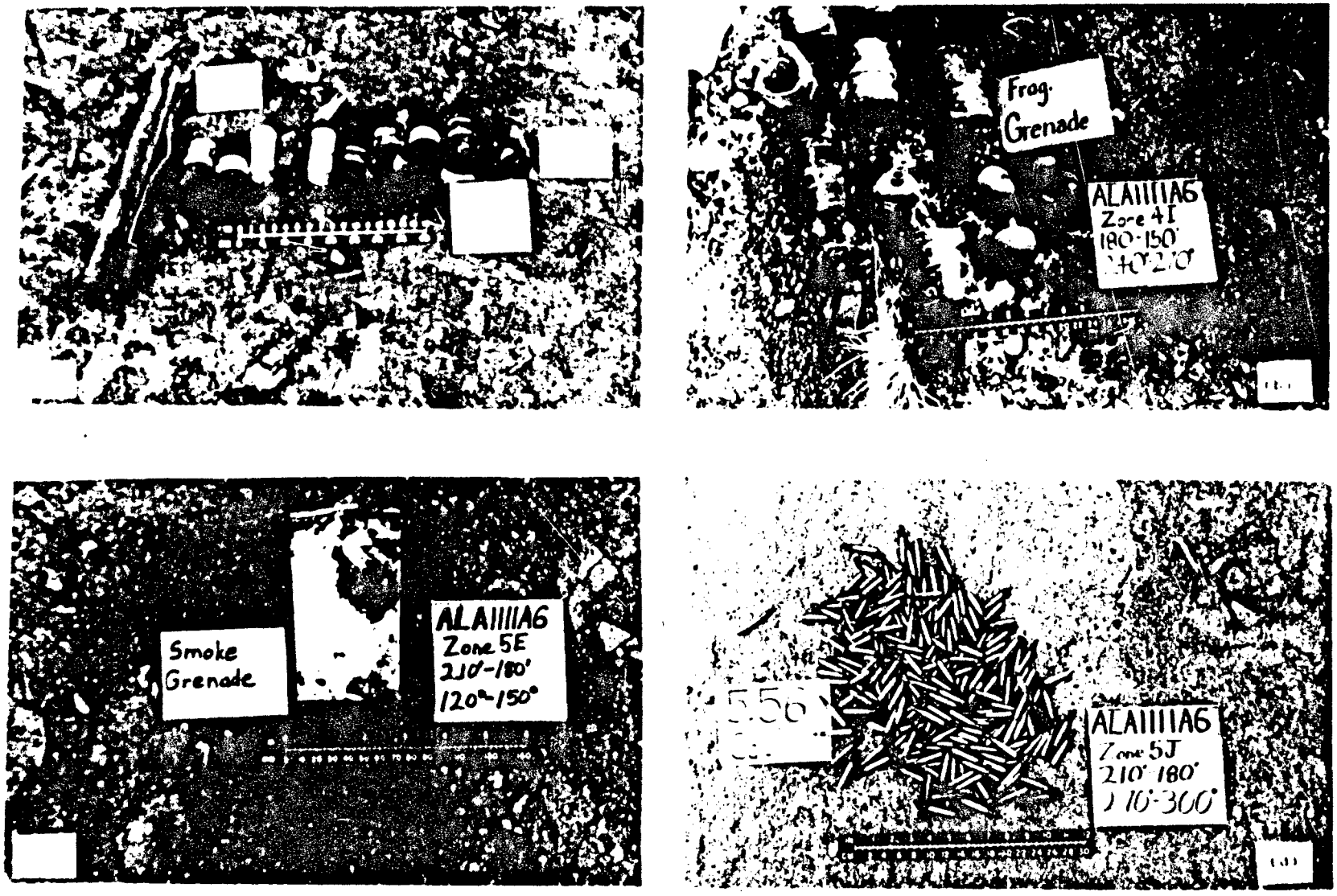

Figure A-4. Test 2. (a) 66-mm Rockets and Smoke Grenades; (b) Frag. Grenades; (c) Smoke Grenades; and (d) 5.56 mm.

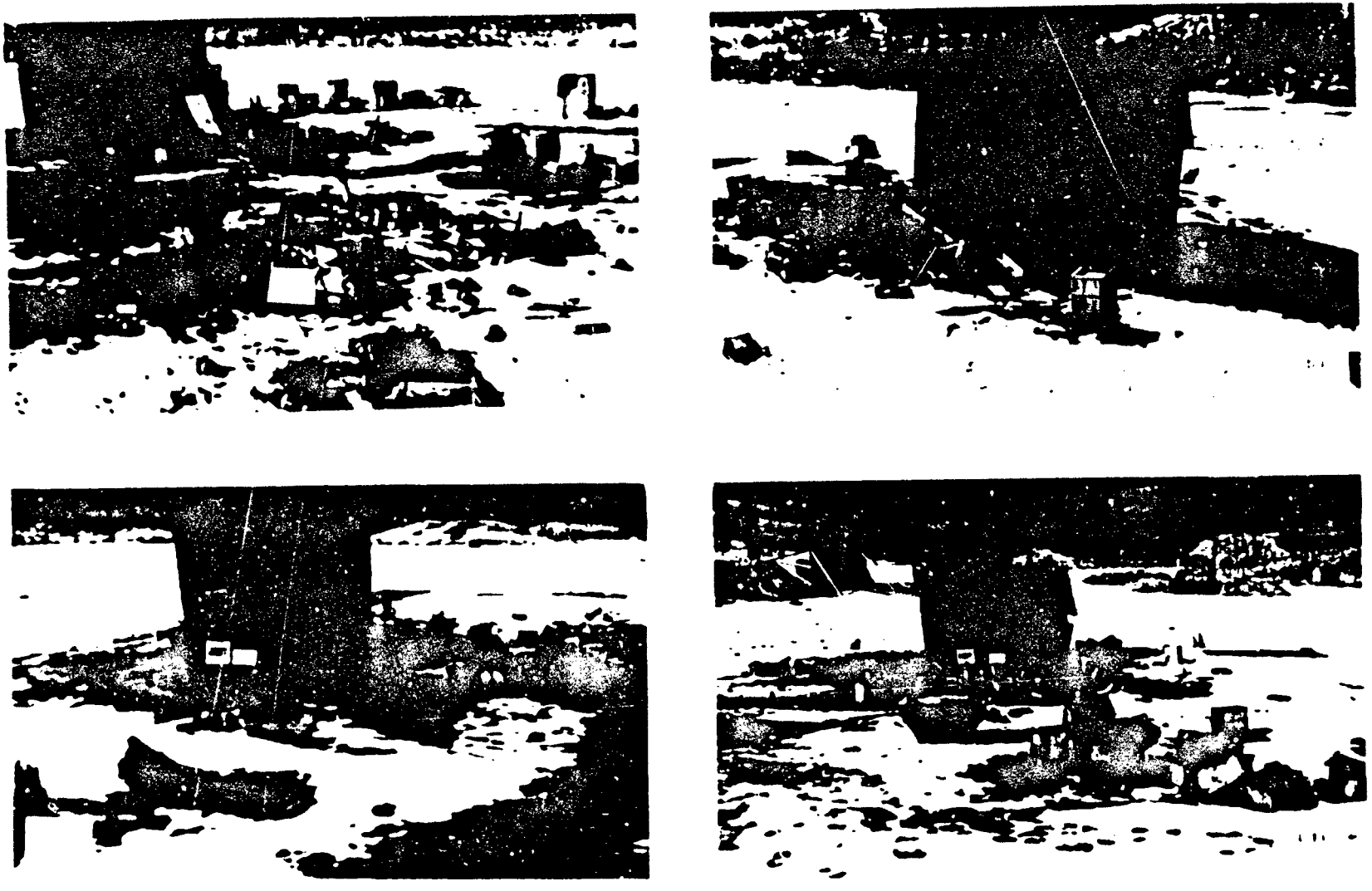

Figure A-5. Test 2. (a) Left Side, (b) Front Side, and (c) Back Side of Acceptor Conex; and (d) Acceptor Conex and Munition from Donor Conex.

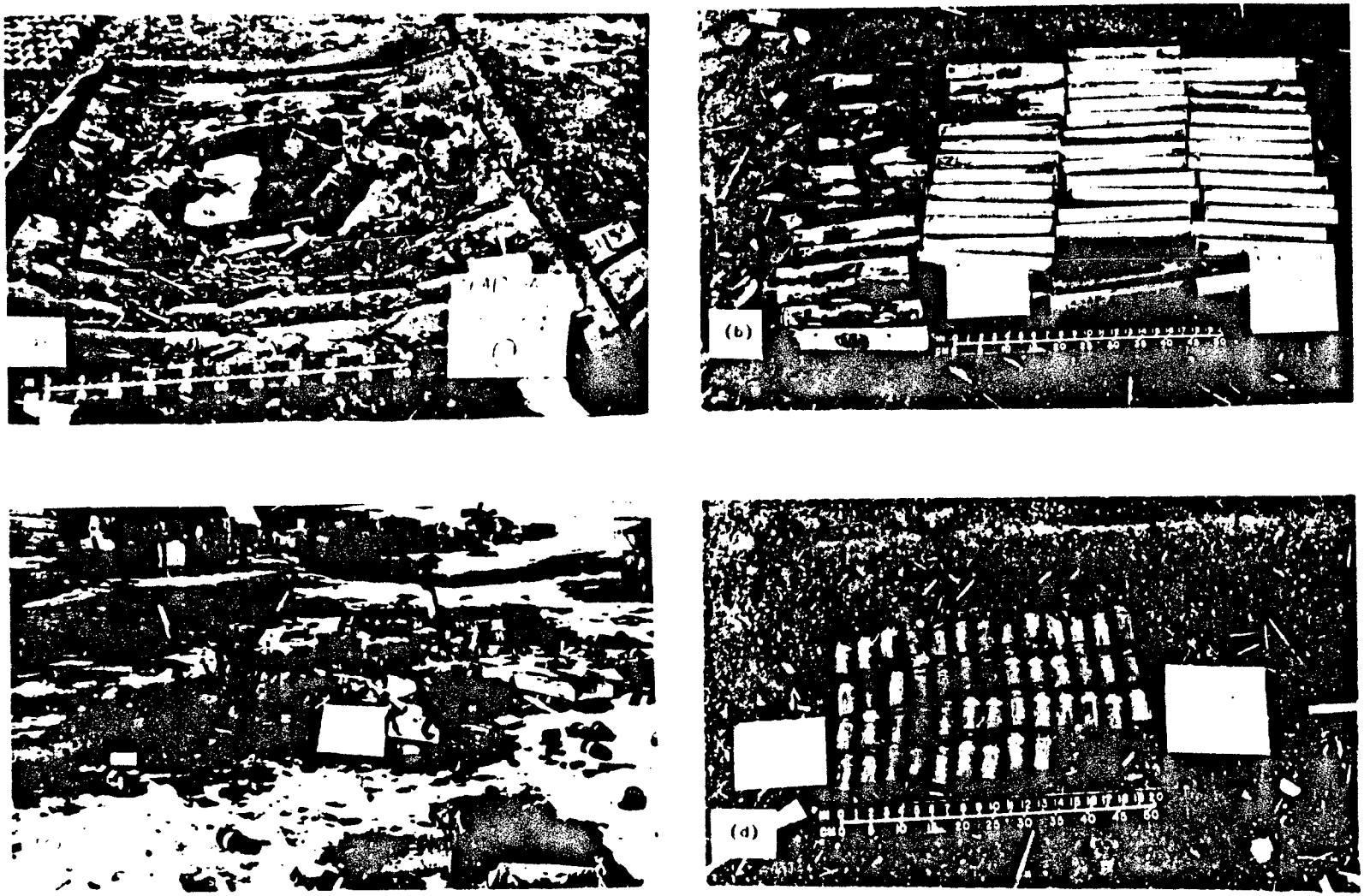

Figure A-6. Test 3. (a) Bottom of the Donor Conex; (b) Signal Flares; (c) Mixed Munitions from Donor Conex; and (d) M42 Submunition.

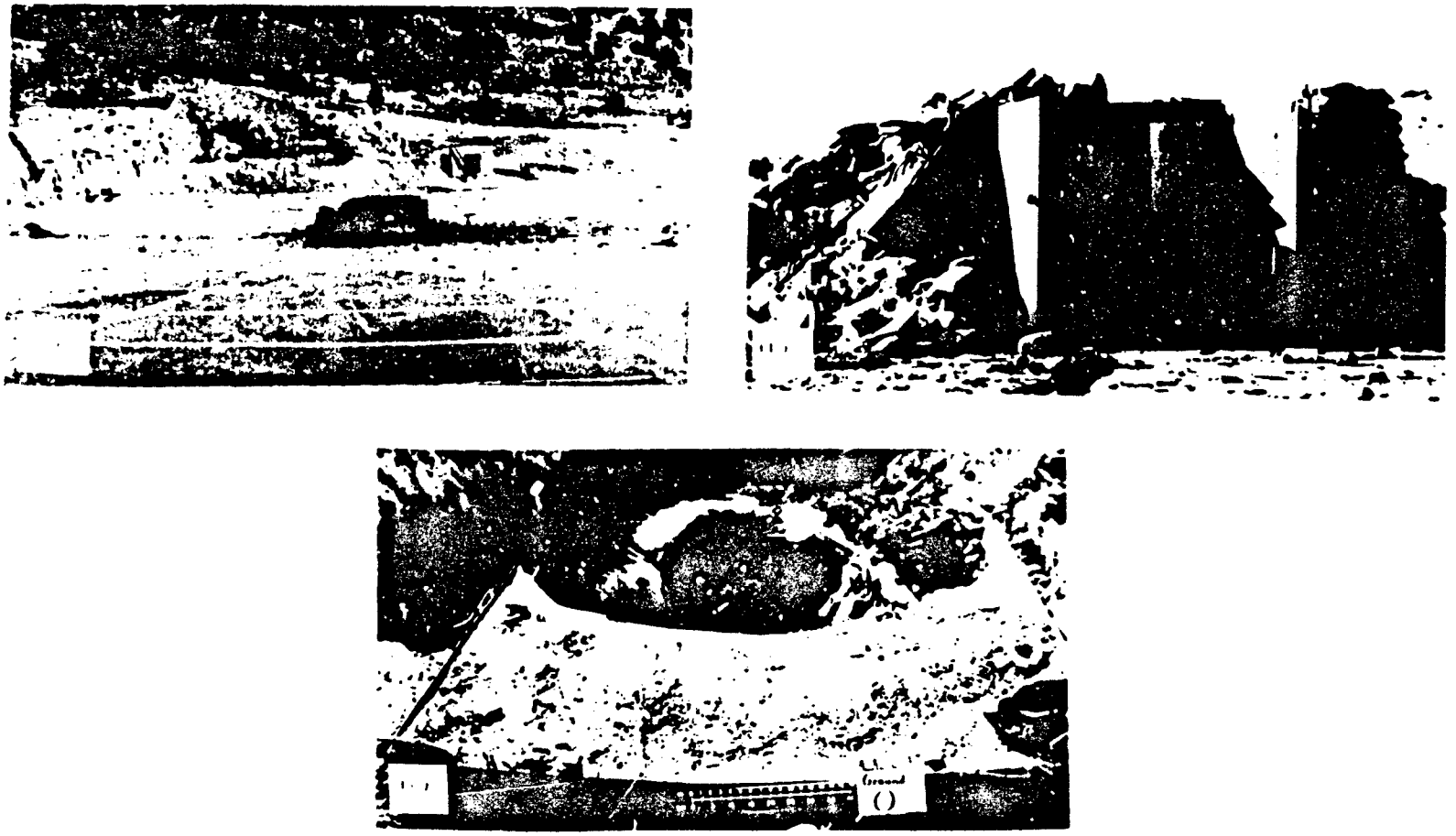

Figure A-7. Test 4. (a) Overall View After the Test; (b) Acceptor Conex; and (c) Bottom Part of the Donor Conex.

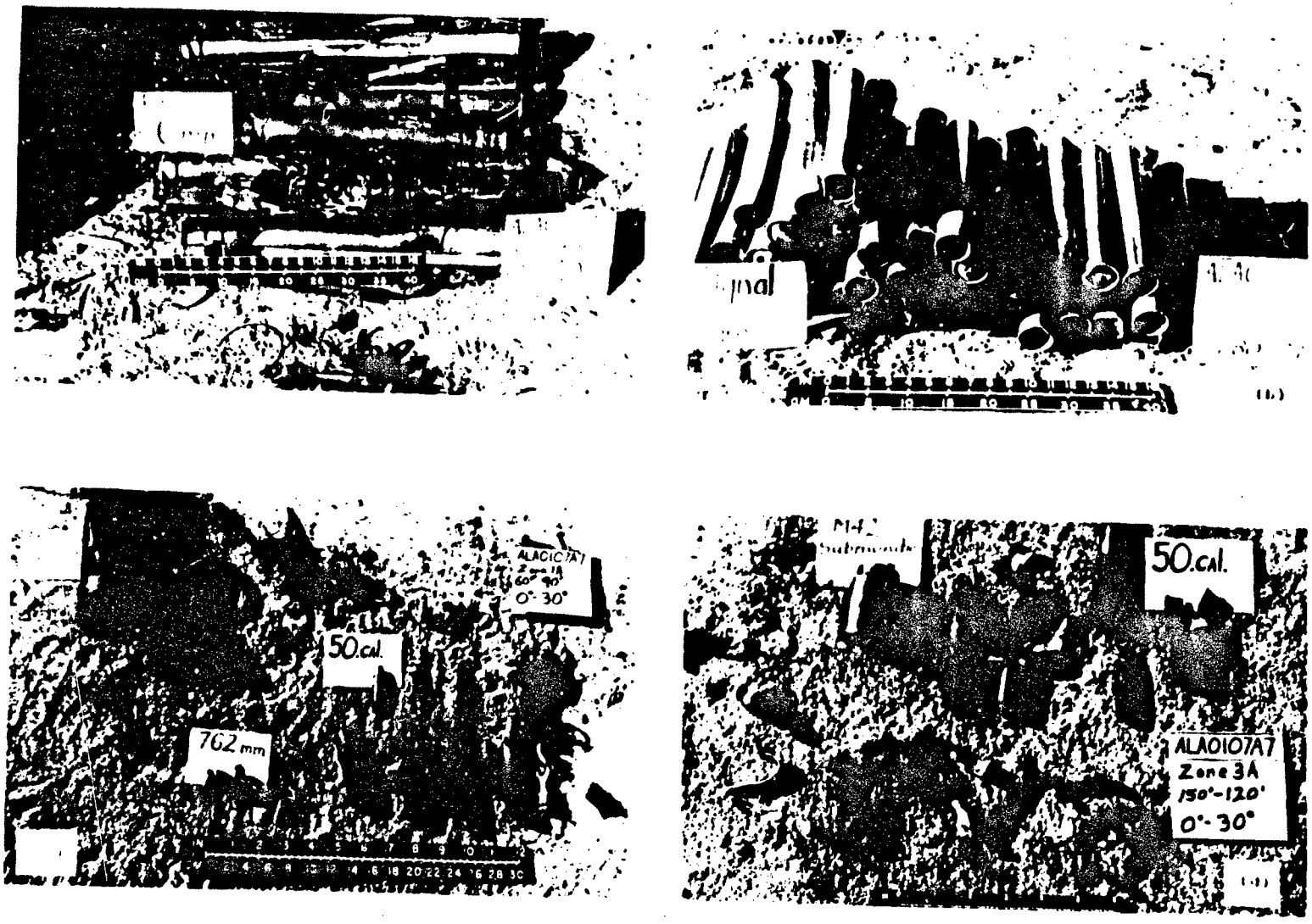

Figure A-8. Test 4. (a) 66-mm Rockets; (b) Signal Flares; (c) Rocket Parts, 50 Cal, and 7.62 mm; and (d) 50 Cal and M42.

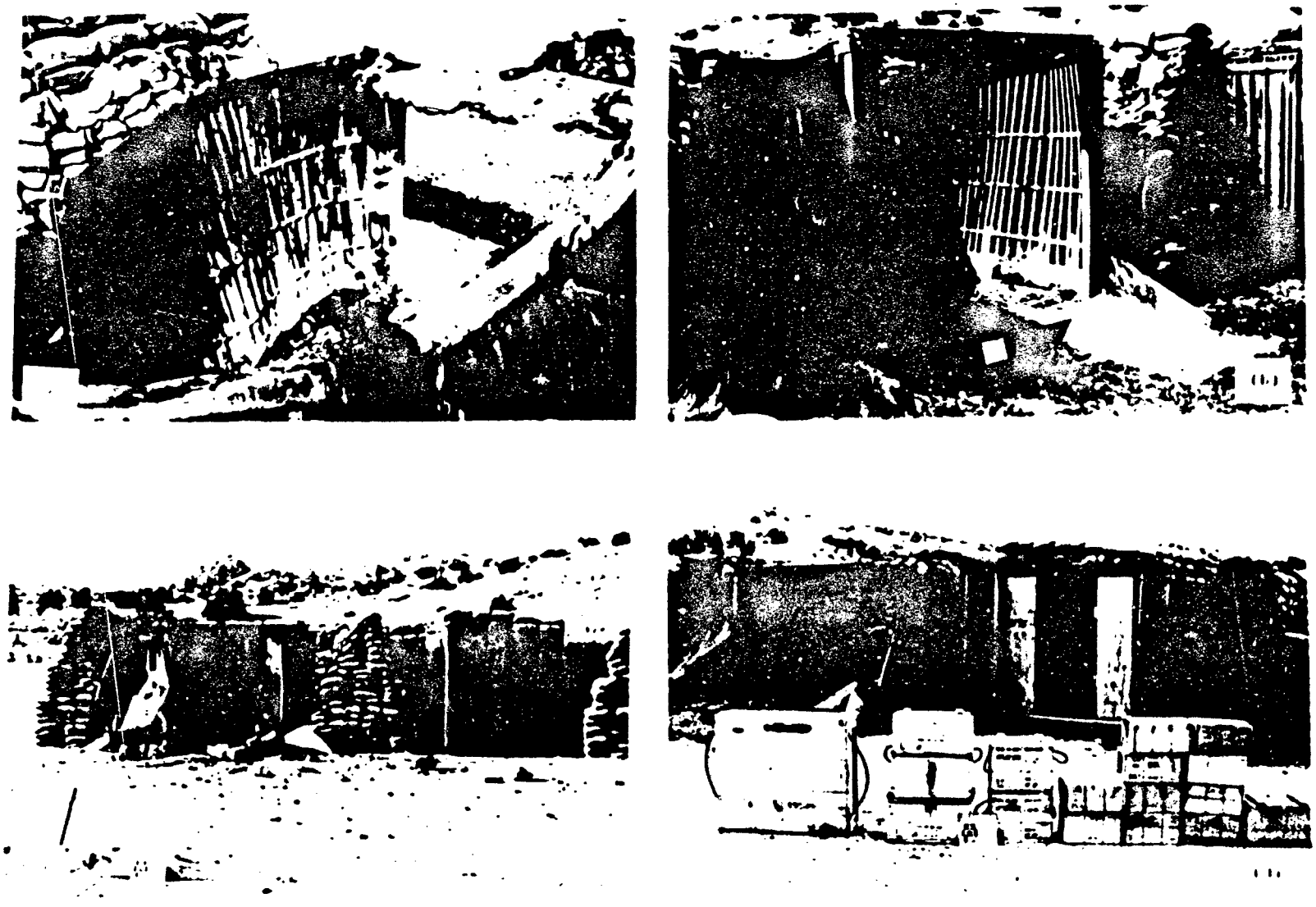

Figure A-9. Test 5. (a) Donor Conex; (b,c) Front Side of Donor and Acceptor Conexes; and (d) Munition from Acceptor Conex.

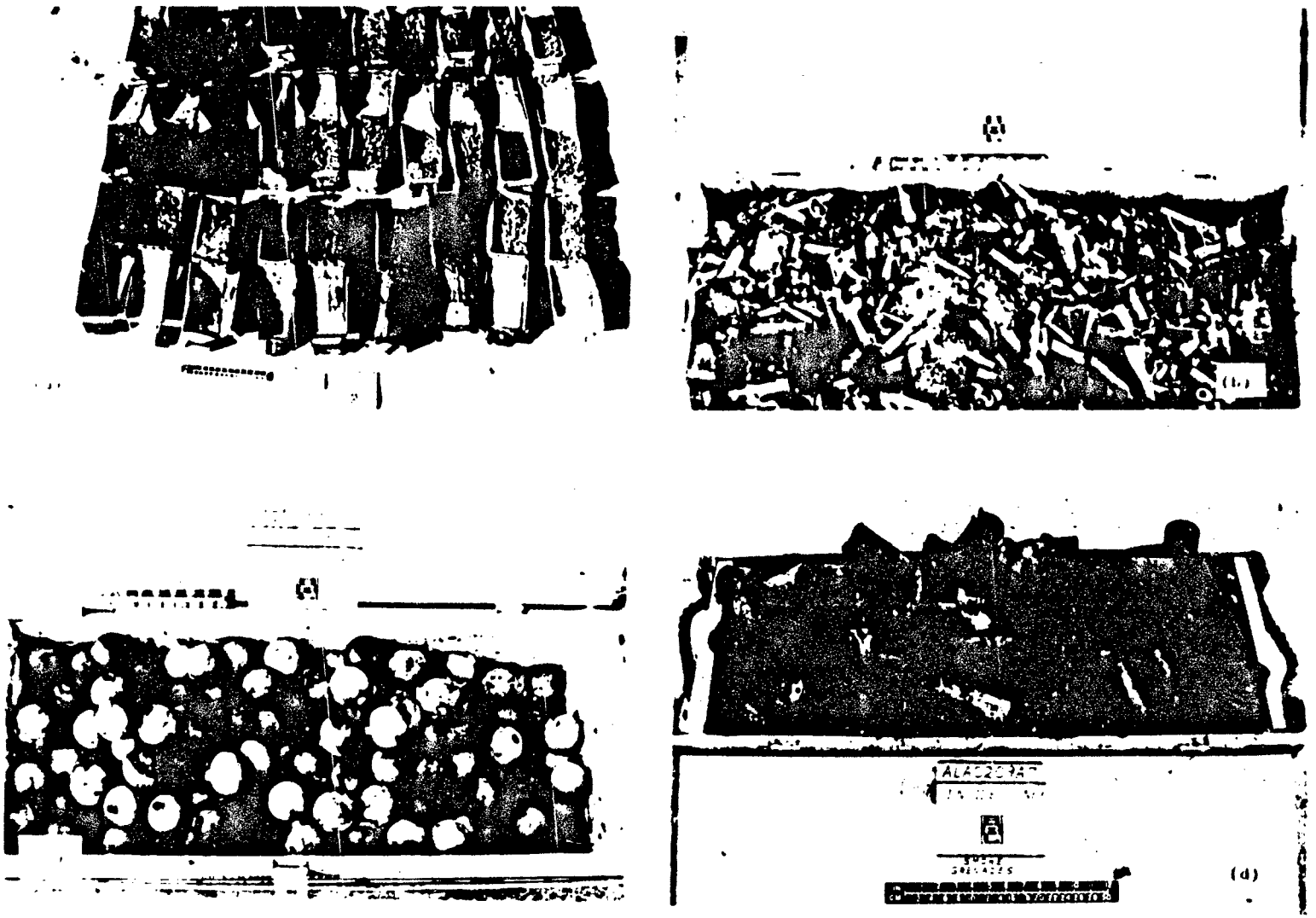

Figure A-10. Test 5. (a) 5.56-mm Ammunition; (b) Burned Munition; (c) Fragment Grenades; and (d) Smoke Grenades. All Burned Inside the Donor Conex.

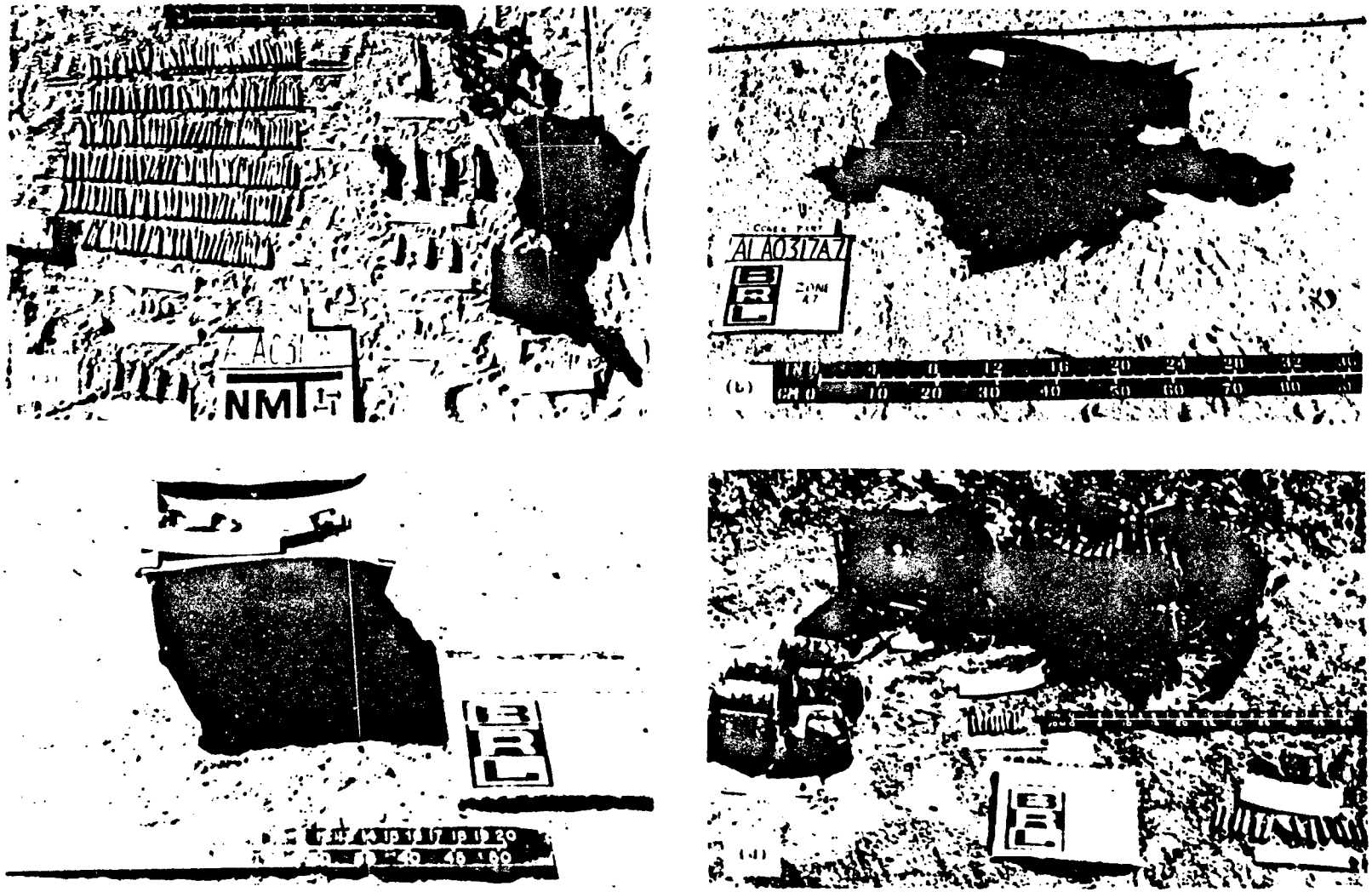

Figure A-11. Test 6. (a) 5.56 mm, 50 Cal, and 7.62 mm; (b) Conex Fragment; (c) Ammo Box; and (d) Smoke Grenades, 50 Cal and 5.56 mm at 240 - 270 ft.

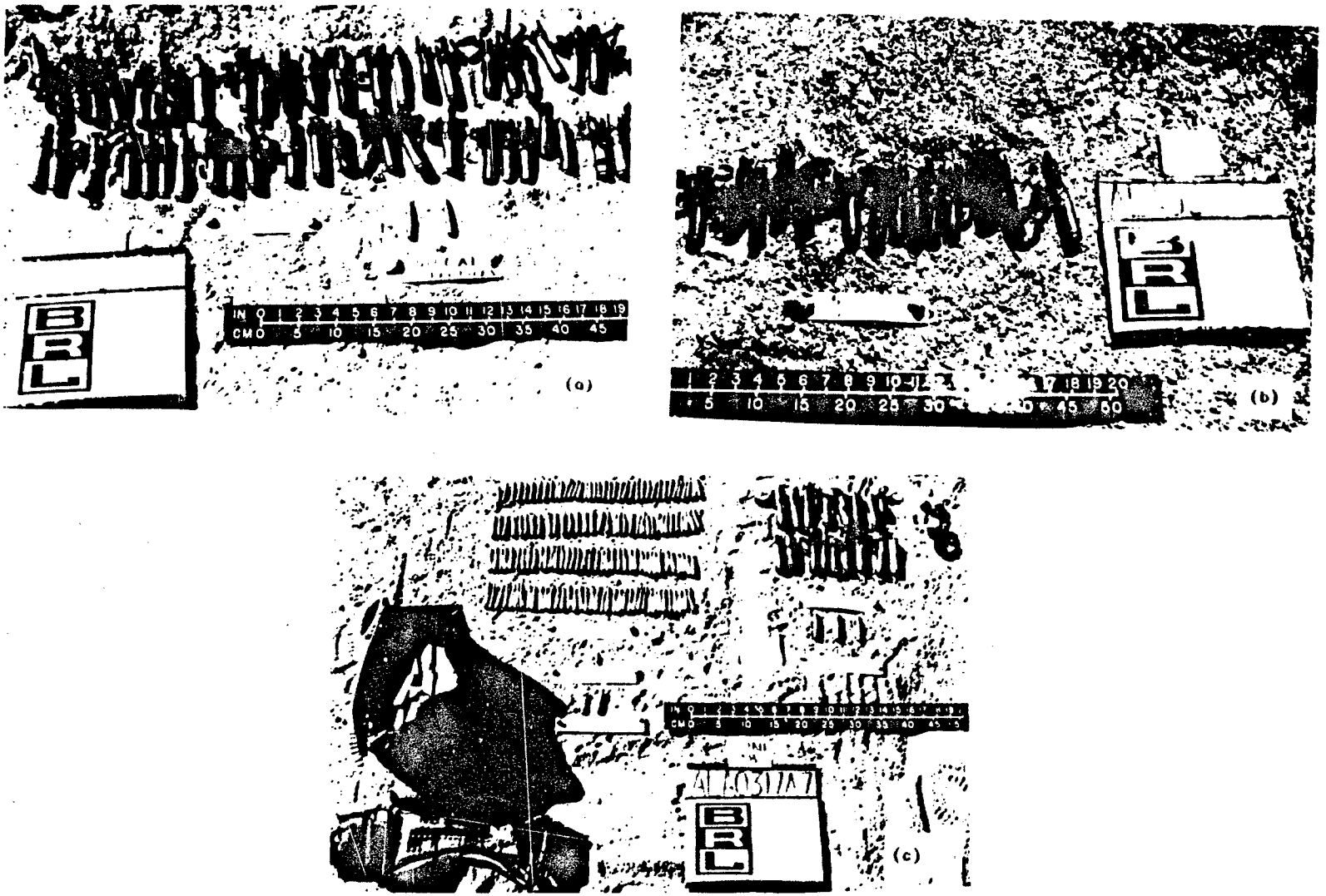

Figure A-12. Test 6. (a) 50 Cal; (b) 50 Cal Cases; and (c) 5.56 mm and 50 Cal at 270 - 300 ft.

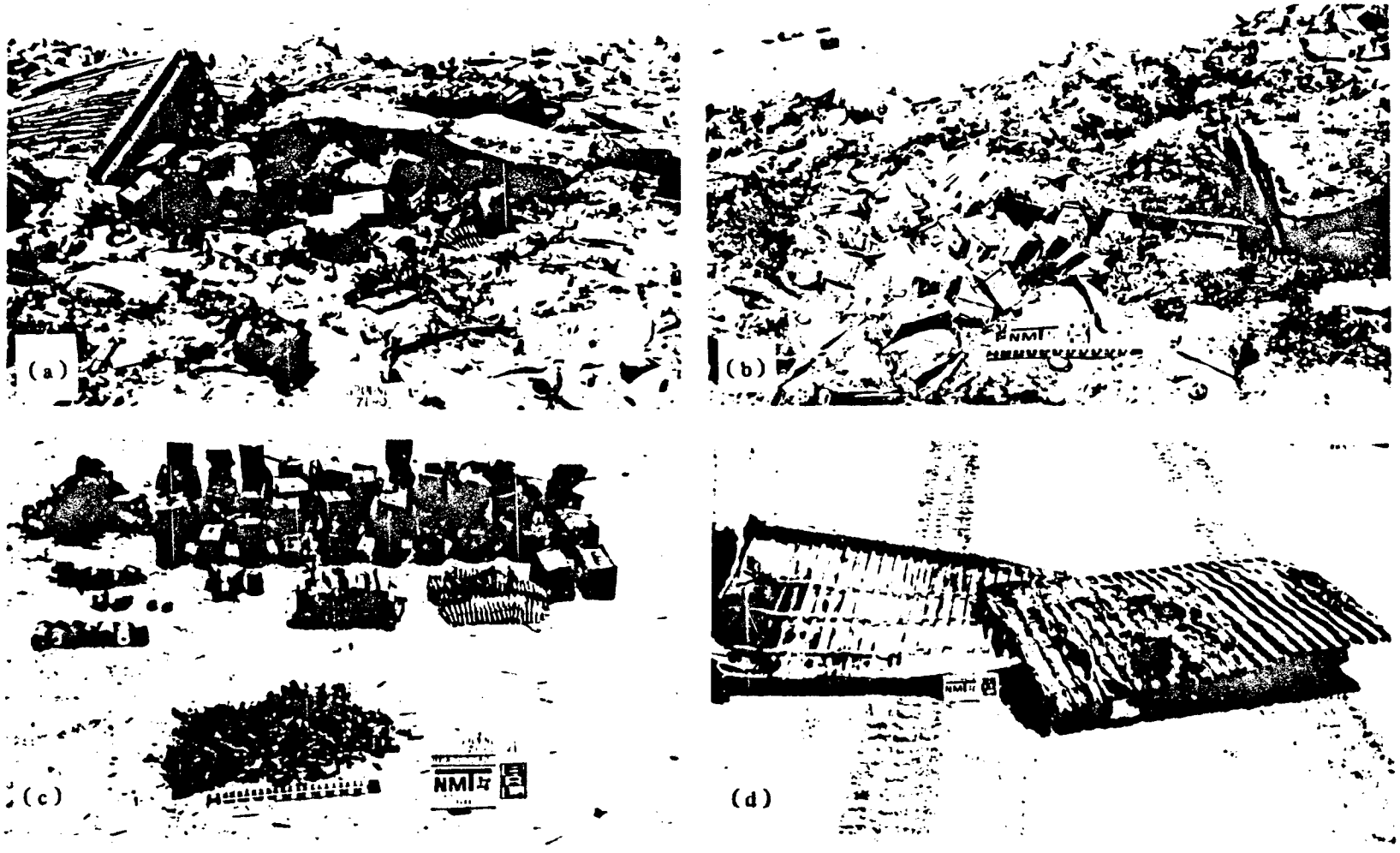

Figure A-13. Test 7. (a), (b), (c), and (d) Conex Part, Ammo Boxes, Mixed Munition, and Conex Part at Ground Zero.

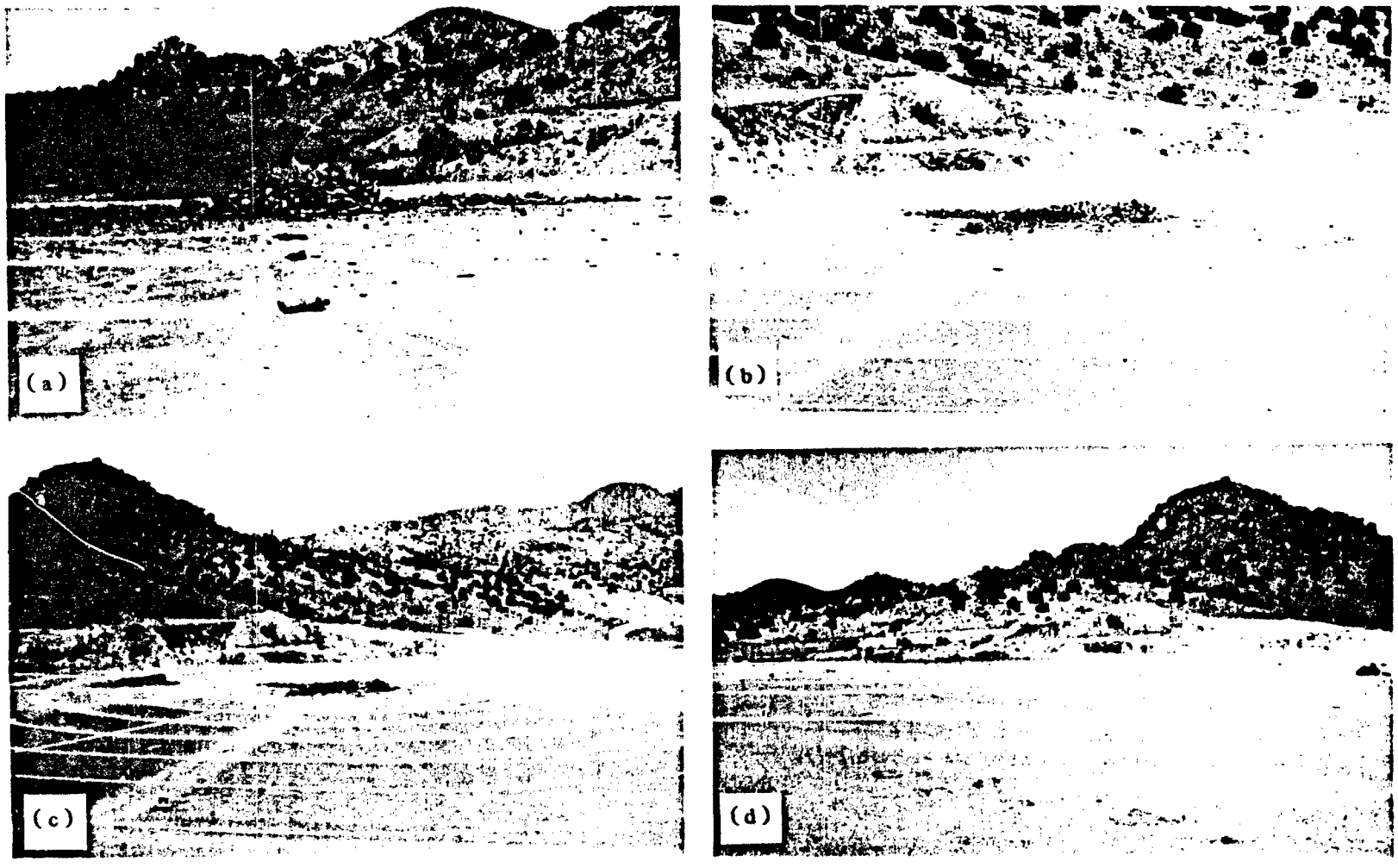

Figure A-14. Test 7. (a), (b), (c), and (d) Overall View of the Post-Test Site.

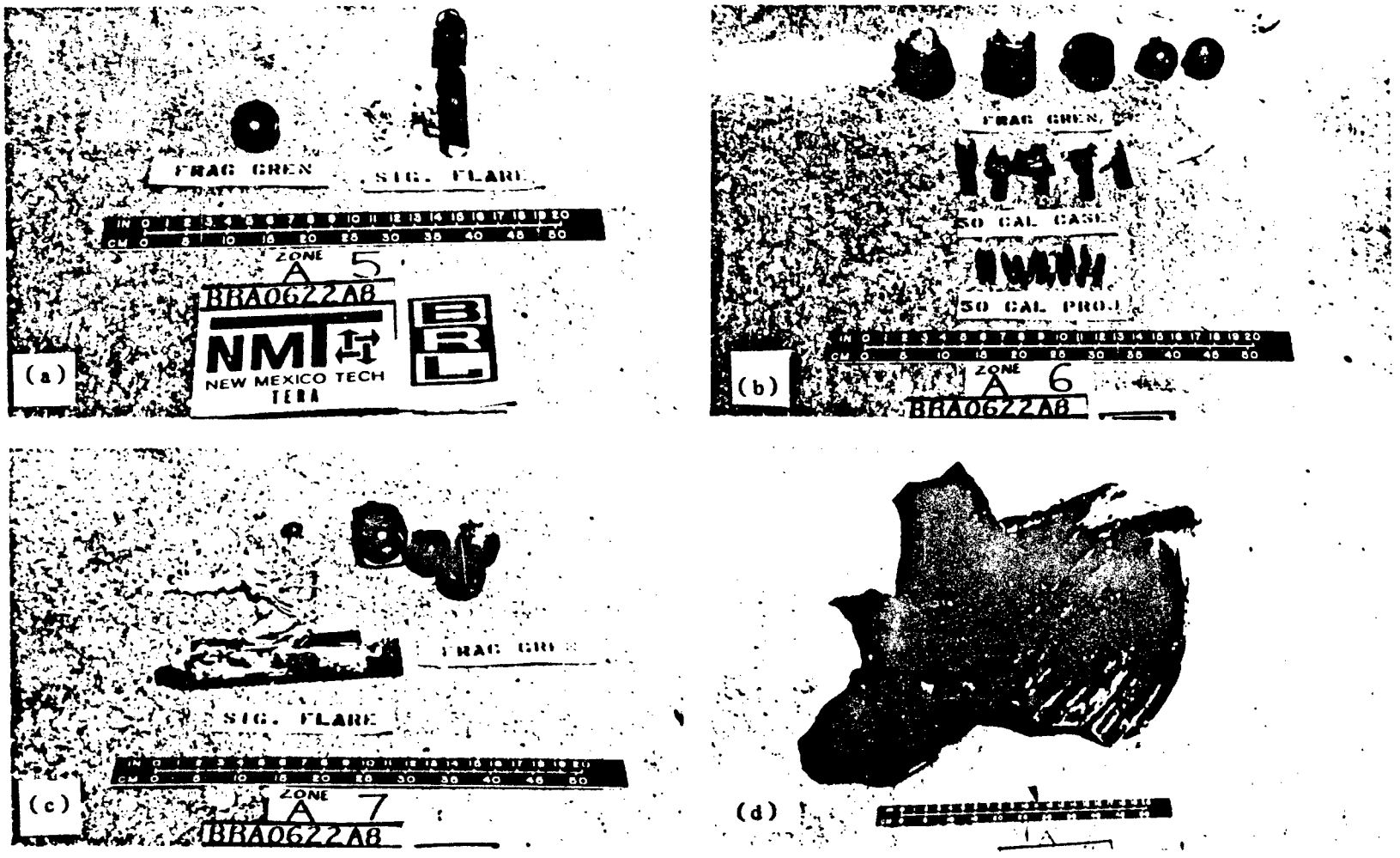

Figure A-15. Test 7. (a) Grenades and Flare Between 180 and 210 ft; (b) Grenades and 50 Cal Between 210 ft and 240 ft; (c) and (d) Grenades, Flare and Conex Part Between 240 ft and 270 ft.

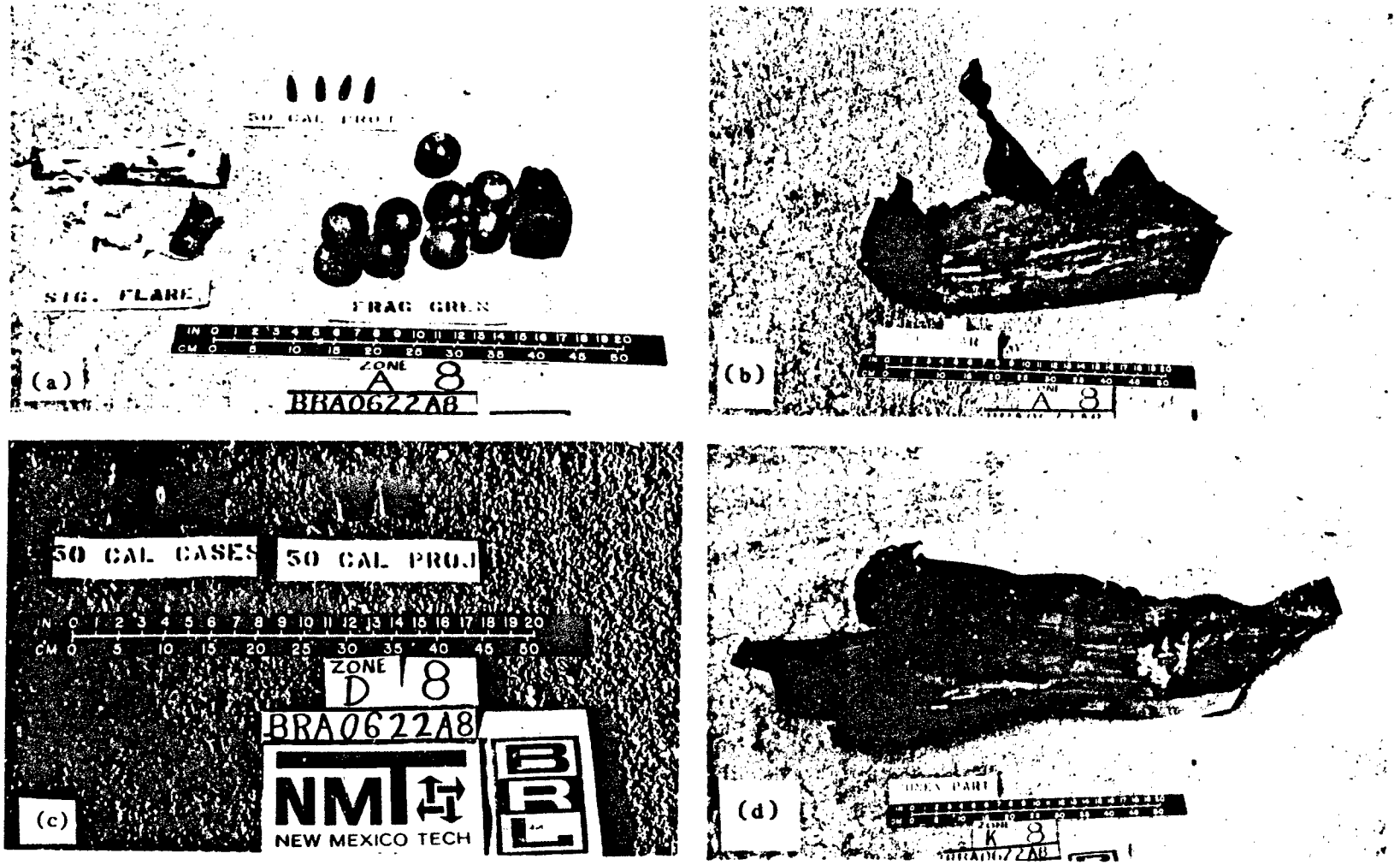

Figure A-16. Test 7. (a) Flare, 50 Cal and Grenades; (b) and (d) Conex Parts; (c) 50 Cal Between 270 ft and 300 ft.

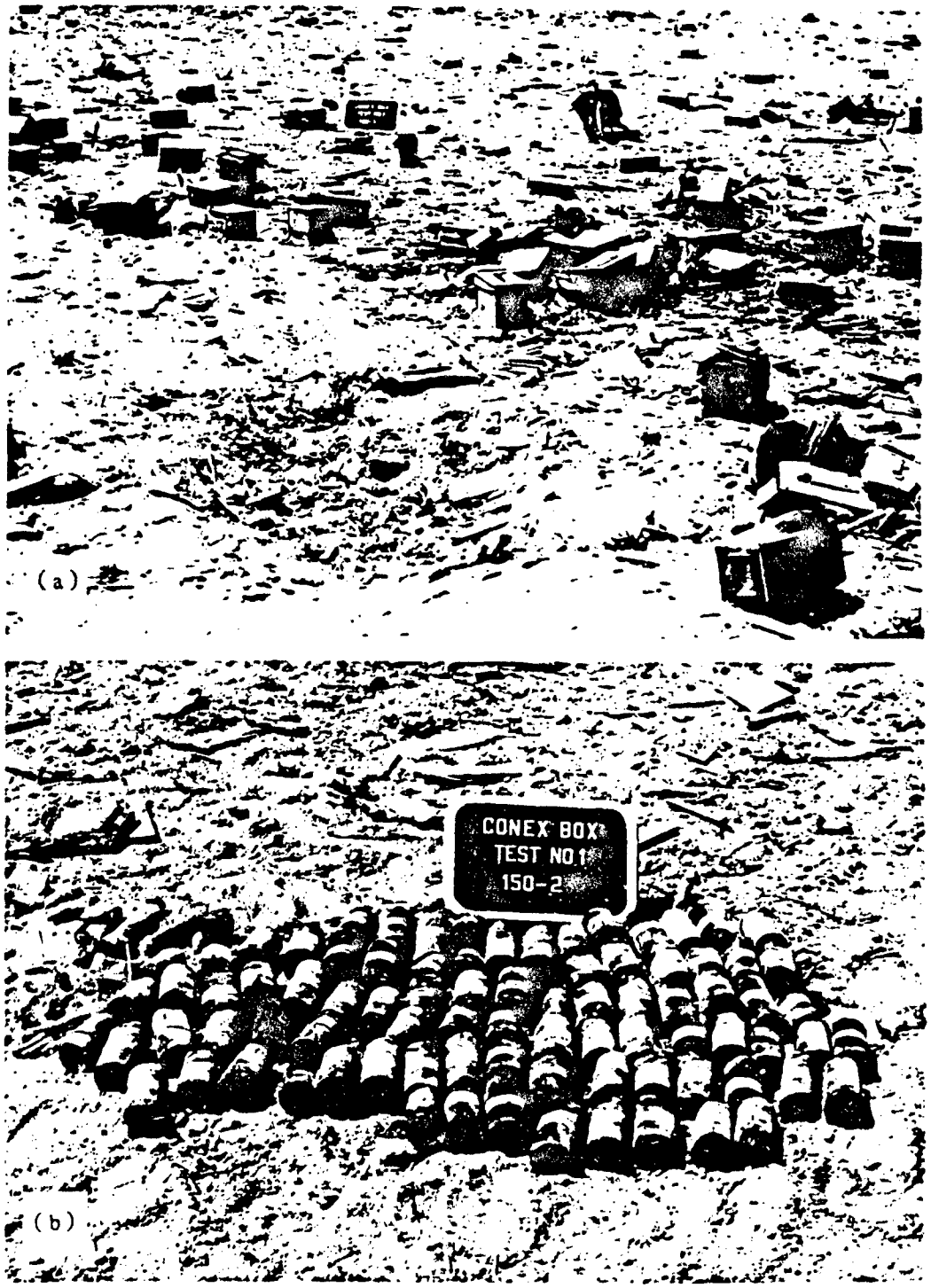

Figure A-17. Test 9. (a) Assorted Munitions at Ground Zero: (b) Smoke Grenades Between 60 ft and 90 ft.

Figure A-18. Test 9. (a) Smoke Grenades and 50 Cal Between 60 ft and 90 ft; (b) Smoke Grenades Between 120 ft and 150 ft.

Figure A-19. Test 9. (a) Conex Part Between 300 ft and 400 ft; (b) Conex Part and Smoke Grenades Between 500 ft and 600 ft.

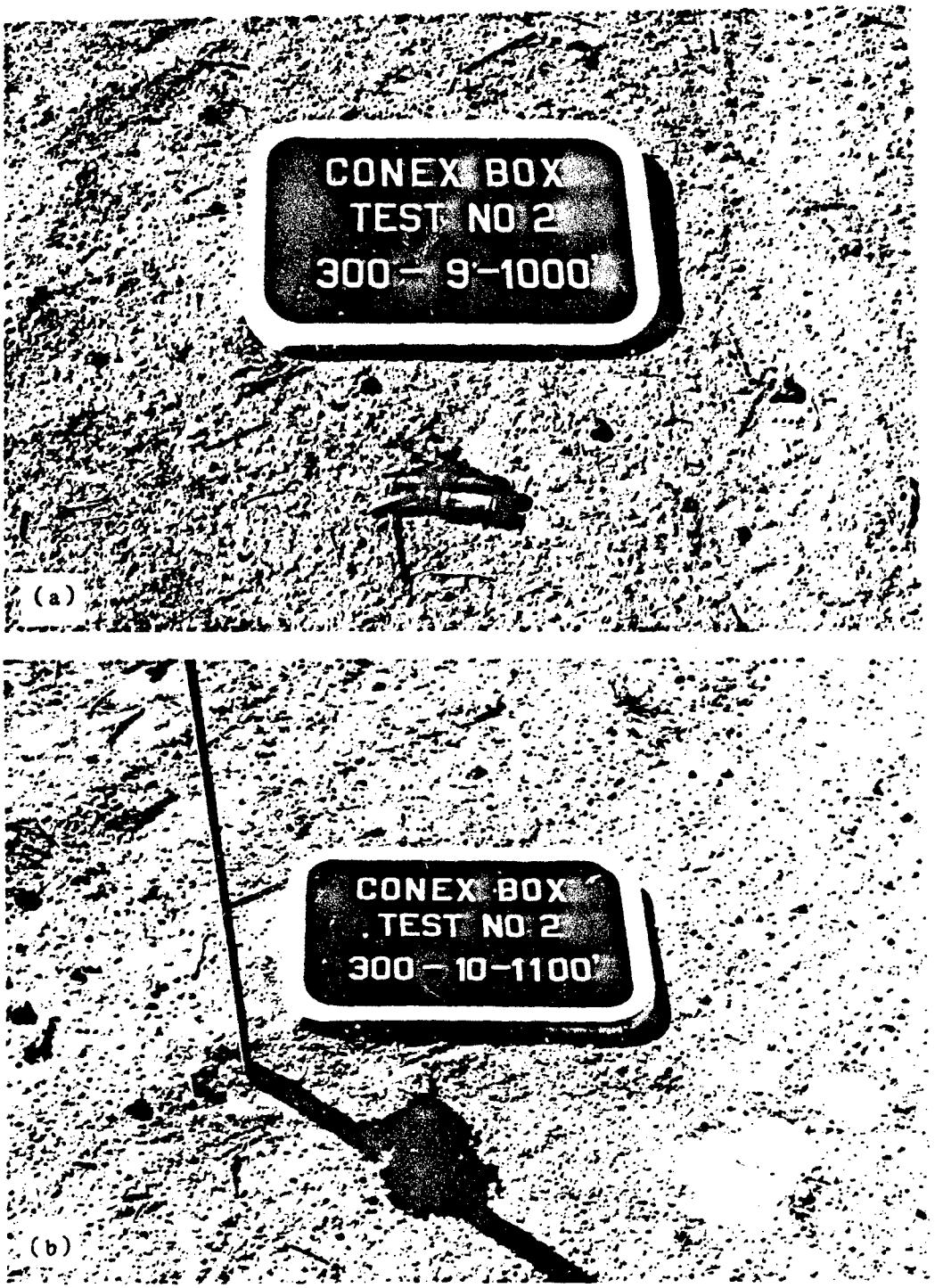

Figure A-20. Test 10 (a) Small Caliber at 1,000 ft; (b) Smoke Grenade at 1,100 ft.

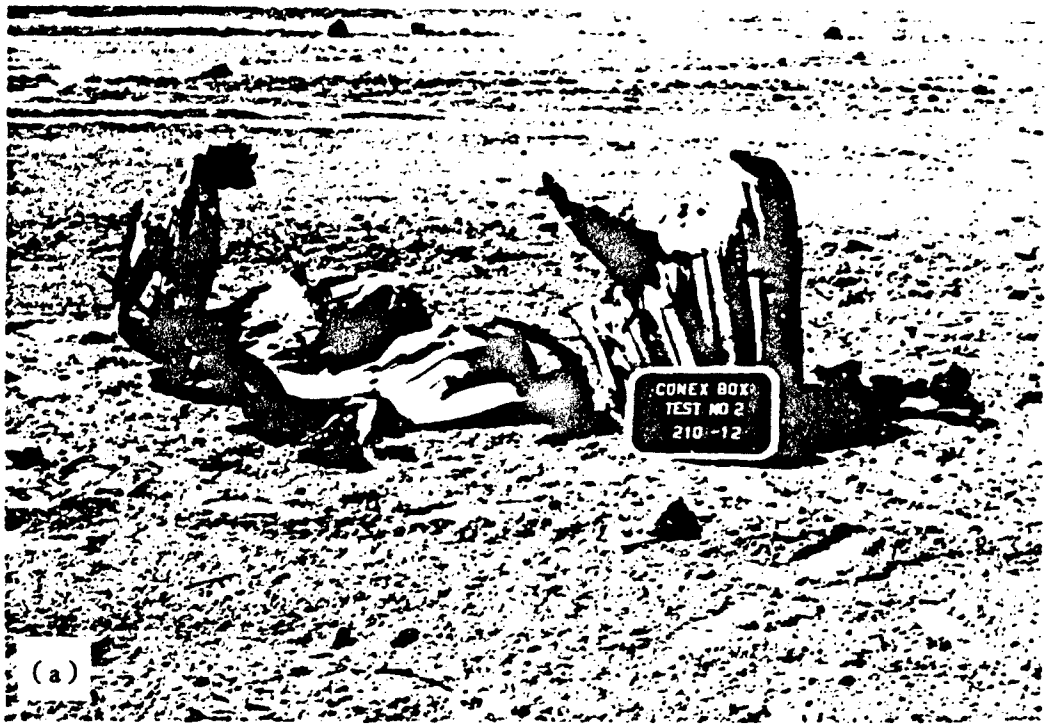

Figure A-21. Test 10. (a) and (b) Conex Parts and Small Caliber Munition Between 500 ft and 600 ft.

Figure A-22. Test 10. (a) Conex Part Between 300 ft and 400 ft; (b) Conex Part Between 400 ft and 500 ft.

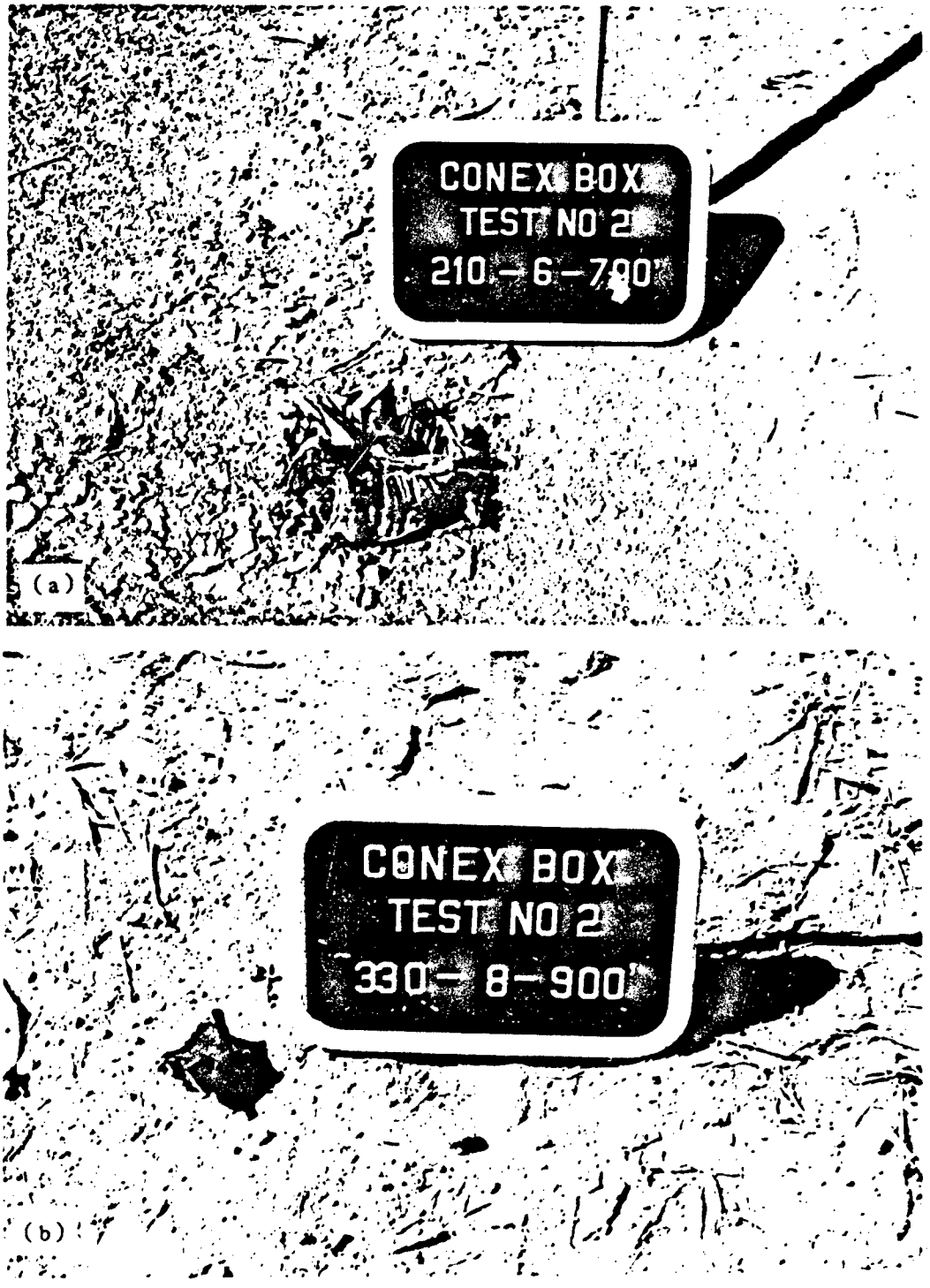

Figure A-23. Test 10 (a) Small Caliber at 700 ft; (b) Smoke Grenade at 900 ft.

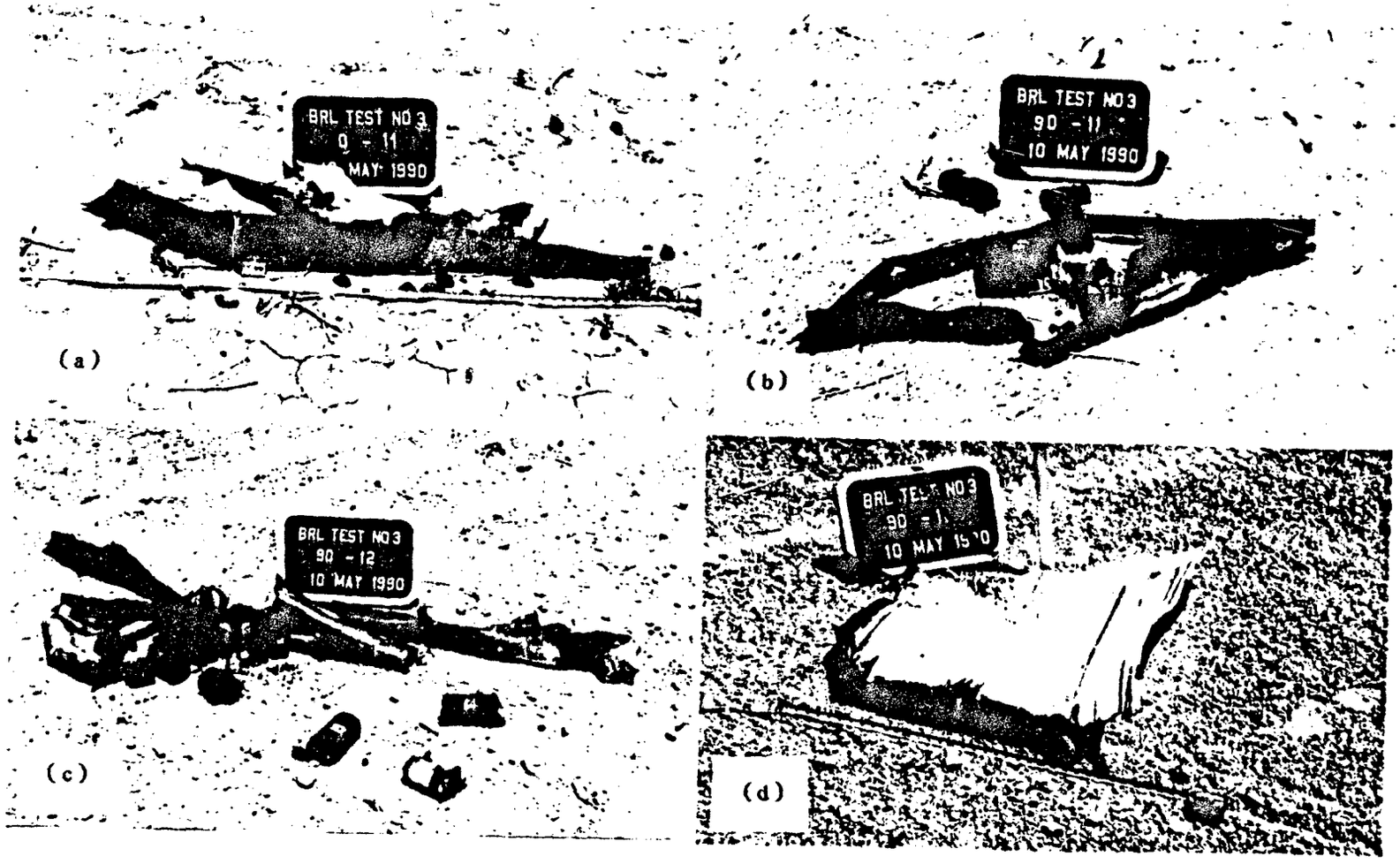

Figure A-24. Test 11. (a) and (b) Conex Part and Grenades Between 400 ft and 500 ft; (c) and (d) Conex Part, Flares and Grenades Between 500 ft and 600 ft.

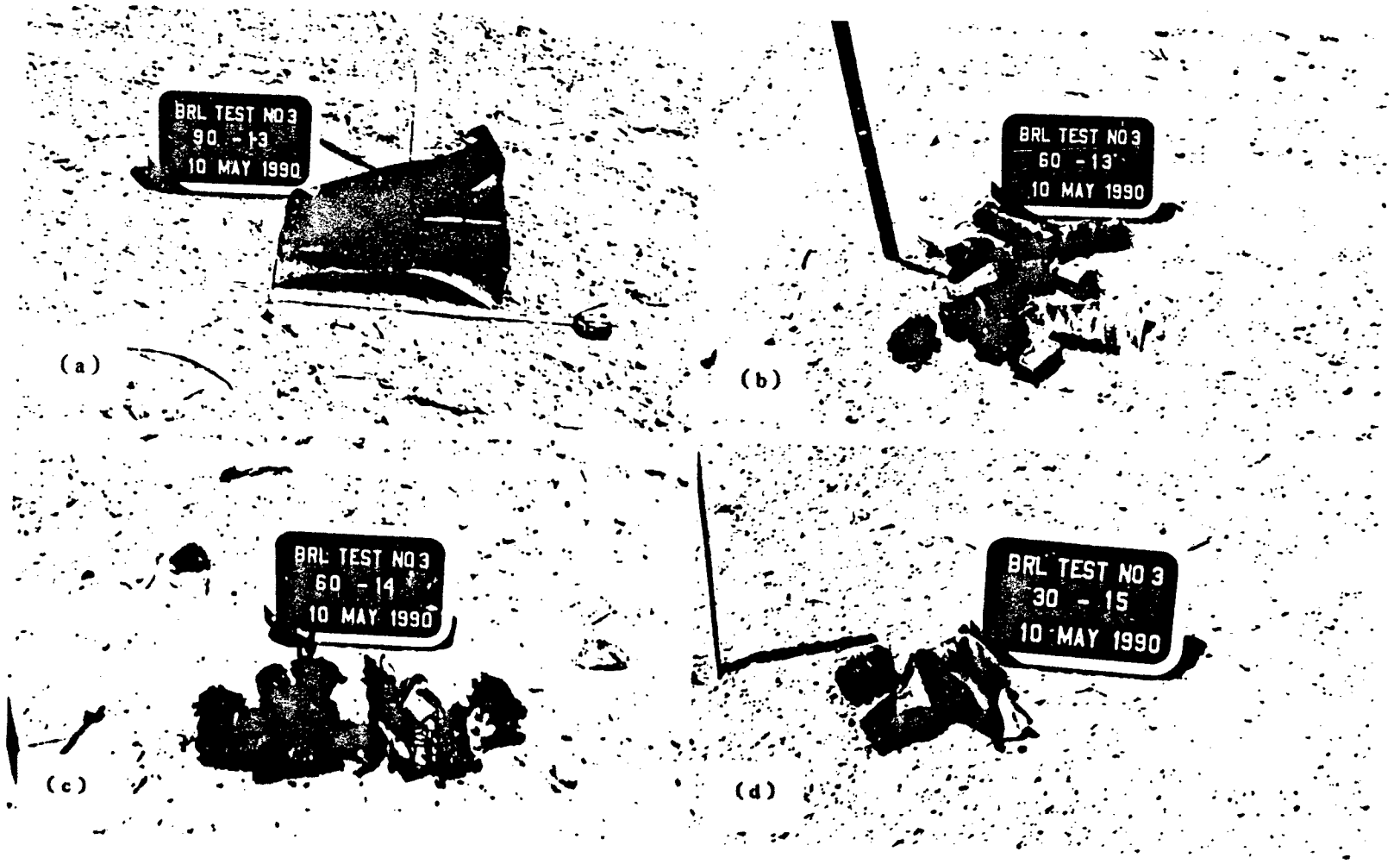

Figure A-25. Test 11. (a) and (b) Conex Part, Flares and Grenades Between 600 ft and 700 ft; (c) Conex Part and Grenades Between 700 ft and 800 ft; and (d) Conex Part Between 800 ft and 900 ft.

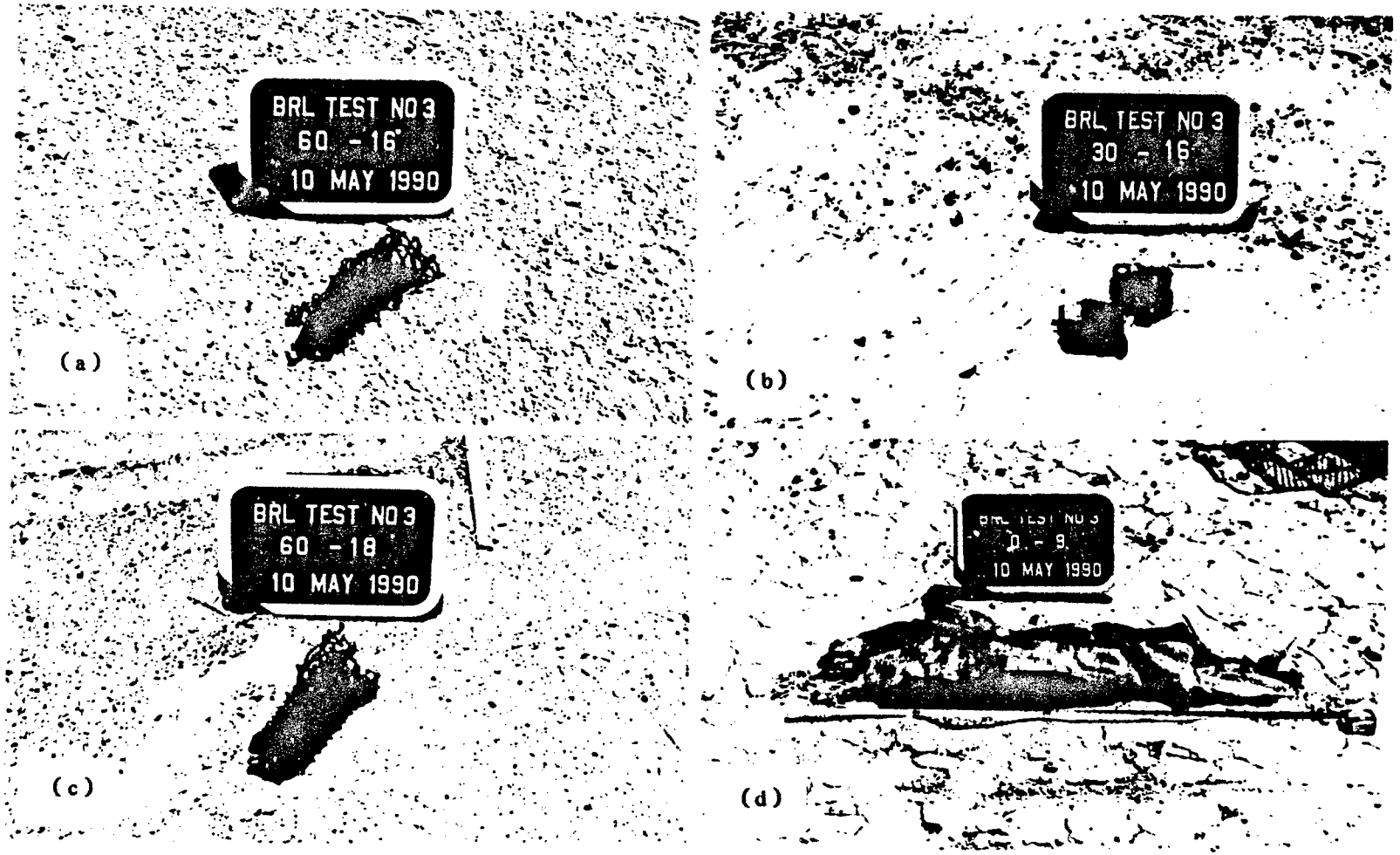

Figure A-26. Test 11. (a) and (b) Link Fencing and Grenades Between 900 ft and 1,000 ft; (c) Link Fencing Between 1,100 and 1,200 ft; and (d) Conex Part Between 270 ft and 300 ft.

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7. If indicating a Change of Address or Address Correction, please provide the New or Correct Address in Block 6 above and the Old or Incorrect address below.

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